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CURRENT PROPOSALS FOR THE ORGANIZATION OF CONSERVATION AND LAND-USE PROGRAMS IN AGRICULTURE, THE UNITED STATES

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THE present purpose is to set forth and criticize current proposals for administrative organization of agricultural conservation programs as found in the Hope and Aiken Bills and in the analyses of the Department of Agriculture (USDA).[1] Many signs point toward an early, full-dress reorganization of administration in agricultural conservation programs.[2] There are impressive difficulties. The farm organizations are divided in their interests and proposals. Considerable friction exists between the Land-Grant Colleges and certain agencies in the USDA, between the USDA (especially the SCS) and the TVA, and between the SCS and the Field Service Branch of PMA (the old AAA organization). No little difference of viewpoint is manifest, even between Republican leaders in the Senate and House; indeed, it may be that a gulf is developing between the Senate and House Office Buildings over agricultural policy.

All this means that new agricultural policy will not be easily evolved. One concludes further that when new and comprehensive policy does come it is likely to be with us for many years. The last major revision of agricultural policy was in 1938. The difficulty of the process of policy formation bespeaks a continuance of whatever legislation finally emerges.

[1] Other abbreviations used include Soil Conservation Service (SCS) and Production and Marketing Administration (PMA).

[2] In addition to what follows, the farm organizations have proposals on the subject; the Hoover Committee on Organization of the Executive Branch of the Government has groups working on both agricultural activities and federal-state relations; and the National Planning Association has a pamphlet in preparation on federal-state-local relations in agriculture.

This paper pretends to no exhaustive analysis of the forces behind various proposals and the institutional processes of pressure and policy formation involved. It is neither possible nor desirable to divorce policy formation from the play of interested groups. Even the field hearings of the House Committee on Agriculture in 1947 testify to the pervasiveness and energy of agencies and associations in organizing and presenting testimony. Farm organization representatives were, of course, generally present, as were state commissioners of agriculture. In the Kansas City, Missouri, Hearings (Oct. 29, 1947), eight men, all soil conservation district supervisors or officers in state associations of supervisors, spoke for SCS. One county AAA committee sent in a memorial. In the Montgomery, Alabama, Hearings (Oct. 40, 1947), 27 farmers testified of whom 17 were particularly interested in the continuance of one part or another of the AAA program while five especially favored the SCS. The Farm Credit Administration and the Rural Electrification Administration were often subject of strong endorsements. Occasionally some farmer would emphasize that he was representing no government agency.

These remarks suggest two broad observations, although neither will be further developed here.[3] First, the issues over the organization of agricultural administration are generally presented by groups and agencies in terms of their own estimations of their own interests. The issues arise over the division of *administrative* authority. There is apparently no discussion of the possibilities of *political* decentralization so that responsible political decisions in agricultural policy might be made at some level other than Washington. Of course, no firm line can be drawn between what is political and what is administrative.[4] Second, the field hearings suggest the significance of thorough studies of attitudes and opinions among farmers relative to soil conservation, credit, regulation of production, price supports, etc. Federal programs since 1933 appear to have profoundly influenced farmers' attitudes. We ought to try to understand the effects upon the structure of opinion in agriculture of the programs we have, their rationalizations, and the forms of their administration—especially the AAA committee system and the soil conservation districts.

[3] Cf. Charles M. Hardin, "Reflections on Agricultural Policy Formation," *American Political Science Review*, Oct., 1948.

[4] See, e.g., V. O. Key, "Politics and Administration," in L. D. White, ed., *The Future of Government in the United States*, Paul Appleby, "The Influence of the Political Order," *American Political Science Review*, April, 1948.

I. THE AGRICULTURAL ACT OF 1948

For a grinding year, Congressmen, Senators, their advisers, members of the USDA, farm organization leaders, and many others have worked hard to shape new agricultural policy. In the final minutes of the 80th Congress and with some acrimony, both houses accepted H. R. 6248 as recommended by the conference committee.[5] Otherwise the amended Acts of 1941, which provide price supports at 90 percent of parity or comparable price for the "basic" and "proclamation crops," would have soon expired; subsequently, the legal basis of the farm program would have reverted to the AAA of 1938.

The House of Representatives acted in effect temporarily to extend the current situation. But the Senate substituted the comprehensive Aiken bill. Conferences met exhaustively, finally to agree upon a measure which combines the House Bill with that part of the Aiken measure which revises the parity program.[6]

The stop-gap part of the Act extends the loan-without-recourse support of cotton, wheat, corn, tobacco, rice, and peanuts, to June 30, 1950, at 90 per cent of parity, except for those producers who reject proposed marketing quotas.

What Congress Did Not Pass

The legislation described omits all current proposals for reorganizing the administration of agricultural programs. During 1947 the House Committee on Agriculture and a sub-committee of the Senate Committee on Agriculture and Forestry held hearings preparatory to drafting long-range agricultural legislation.

In July, 1947, as the first session of the 80th Congress closed, Congressmen Hill (R., Colo.) and Cooley (D., N. C.) and Senators Reed (R., Kan.) and Stewart (D., Tenn.) introduced identical bills to reorganize the conservation programs, chiefly by assigning the

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[5] The action was taken in spite of a previous announcement by the House Committee on Agriculture that it would not report a long-range farm bill in this session. Congressman Hope noted that "There is greater unanimity on the part of farm organizations of this country on this bill than on any important agricultural bill with which I have been familiar." Southern Democrats were bitter critics, especially of the new parity formula, asserting that undue pressure was brought upon the House conferees because of Republican needs for long-range farm legislation on the eve of their Philadelphia convention. Senator Russell remarked that the Senate conferees "deserve the very highest accolade for imposing their will on the House." The Senate accepted the conference report; the House, on a division, accepted it by ayes 147, noes 70. 94 *Cong. Record*, 9448, 9508–16, June 21, 1948 (Daily Ed.)

[6] See C. Kyle Randall, "Many Changes in New Farm Act," *The Agricultural Situation*, Aug., 1948, also, "Summary of 'Agricultural Act of 1948'," BAE, USDA.

Soil Conservation Service (SCS) to the Extension Service at Washington and routing soil conservation work largely through the Land Grant Colleges. Congressman Jensen (R., Ia.) immediately introduced legislation with the counter effect of organizing conservation work through the SCS, which would have been strengthened accordingly. In October, the Secretary of Agriculture proposed a reorganization of agricultural field administration different from either of the above.

Congress met again in January, the word being that Senator Aiken was determined to pass long-range legislation at once but that Congressman Hope felt the time not yet ripe. On March 15, Senator Aiken and others introduced S. 2318. On March 30, Congressman Hope countered with a measure diametrically opposed, H. R. 6054. The Hope bill never emerged from committee. The Aiken bill, significantly amended, was reported favorably, was given priority by the Republican Policy Committee, was amended on the floor, and passed. The need for accomplishments citable at the Republican convention in Philadelphia may have stimulated action.

It is certainly significant that Congress passed parity revision of such controversial nature as to threaten the harmony between the corn and cotton wings of the Farm Bureau,[7] while failing to act upon reorganization proposals. One reason for failure is the conflicting nature of proposals, each of which is strongly backed by powerful administrative organizations and groups. Another reason for holding reorganization in abeyance, of course, is the real possibility of a Republican victory. Whoever becomes Secretary of Agriculture, unless he would sharply break with precedent, will confidently expect to reorganize the department. It is clear that the *administrative structure* in agriculture has become as controversial as the *content* of agricultural price policy. The remainder of this paper will be devoted to the Aiken, Hope, and USDA proposals on the subject.

II. THE AIKEN PROPOSALS

S. 2318 was introduced by Messrs. Aiken, Bushfield, Wilson, Thye, Thomas of Oklahoma, Ellender, and Lucas.[8] It sets forth a

[7] Reference is to the controversy over adoption of the resolution on the "Farm Program," Chicago, Dec., 1947.

[8] Reference should be made to the thoughtful statement accompanying the original bill, "Long Range Agricultural Policy and Program," Senate Report No.

declaration of policy which has the virtue of comprehensiveness. Agricultural policy is placed within a framework of the general welfare. Cooperative administration between the Secretary of Agriculture and the agencies of the several States is designed to achieve abundant agricultural production as related to nutrition and clothing needs; flexible income supports; improved methods of marketing, distribution, etc.; to regulate interstate and foreign commerce in the basic crops (cotton, wheat, corn, tobacco, rice, and peanuts); to expand marketing agreements for selected commodities; and to provide for price supports of highly perishable products, including fresh fruits, vegetables, milk, and eggs, in facilitating diet improvement of low-income families and school children, and in stimulating improved nutrition. Other aims include attaining the cooperation of land-operators in conservation programs, improving the coordination of research related to conservation, providing incentive payments for conservation, and extending and developing adult education in agriculture. Other declarations relating agricultural programs to general conservation and development of resources, providing for the maintenance and strengthening of cooperatives, providing for an extension of social security to farm people, and providing a program for reducing occupational hazards in farming, etc., were eventually omitted.

Title I—Reorganization

Decentralization of Functions

Section 101 requires the Secretary to establish the Bureau of Agricultural Conservation and Improvement, which shall include SCS, and ACP of PMA, plus other activities which the Secretary deems principally related to soil conservation and improvement, or those aspects of programs of the Department which require direct dealing with farmers. Note, however, that, "subject to the supervision and direction to the Secretary," functions are divided between (a) educational, informational, and demonstrational aspects of public programs dealing with farmers, which shall be exercised through the extension services of the United States in cooperation with state agencies, (b) research and investigational functions, exer-

885, 80th Cong., 2d Sess. This should be distinguished from Senate Report 1295 which accompanied the revised bill to the floor. In addition to the original draft and the committee revision, the revised bill as the Senate passed it appears in 94 *Cong. Record* 8871–8877, June 17, 1948 (Daily Ed.).

cised through experiment stations in states and territories in cooperation with the Division of Soil Conservation and Improvement later provided and the office of experiment station, and (c) other functions with respect to these programs dealing with farmers, which shall be carried out at state and county levels, insofar as the Secretary may deem practicable by state agricultural councils and county agricultural associations and executive committees later provided.

An interesting statement follows: "The functions assigned pursuant to this section to the state agricultural councils and the agencies performing cooperative agricultural extension work shall be closely coordinated by the Secretary, and by such councils and agencies."

The Soil Conservation Service under the Aiken Bill

The bill directs the combination of the SCS and ACP programs into the "Bureau of Agricultural Conservation and Improvement." Originally, the Secretary was charged to abolish SCS regional offices, although permission was granted for the agricultural councils of any two or more states jointly to establish regional offices. Taken together with the provisions already noted requiring educational and research work to be channeled through Land-Grant College agencies, this seemed effectively to liquidate the SCS. However, the Senate Committee added a direction to the Bureau of Agricultural Conservation and Development to work with soil conservation districts. Furthermore, an amendment on the floor removed the requirement that the SCS regional offices be abolished.[9] The relevant portion of the bill, as it passed the Senate, provides:

> Except as provided in clauses (a) and (b) of this section [i.e., the provision that educational and research work should be channeled through Land-Grant College agencies], the furnishing of technical assistance, and machinery and equipment to soil-conservation districts and others, as heretofore performed by the Soil Conservation Service, shall be performed by the Bureau of Agricultural Conservation and Improvement in cooperation with the state agricultural councils established pursuant to this act and the soil conservation districts established by State laws. The functions as-

[9] Senator Wherry, in offering the amendment, argued that the SCS regional offices are operated along lines proven efficient by business. He cited the Chrysler Corporation, the John Deere Farm Implement Company, the American Bell Telephone Company, the Equitable Life Insurance Society of the United States, as well as the Federal Reserve System, as providing successful examples of regional administration. 94 *Cong. Record* 8863, June 17, 1948 (Daily Ed.).

signed pursuant to this section to the State agricultural councils and the agencies performing cooperative agricultural extension work shall be closely coordinated by the secretary and by such councils and agencies.

Thus little is actually done to insure the amelioration of the present controversy over direct technical assistance by the federal government to farmers via soil conservation districts. The final provision for "close coordination," considering the agencies which are to do the coordinating, really constitutes a plea for cooperation. In short, as the bill finally passed the Senate, the chief controversial questions of federal-state-local relations in the administering of the conservation program remain unresolved.[10]

Community, County, and State Agricultural Committees and Councils

Sec. 105 provides, in effect, for the continuation of community and county AAA committees, as they have developed in the past, with some changes, and for a new kind of state committee. Local administrative areas, as designated by the Secretary pursuant to the Soil Conservation and Domestic Allotment Act, are the initial geographical units for the community committees, although these may be changed later by the communities themselves. Electors are farm operators (nowhere defined). Elections are annual; elected are three community committeemen, one of whom is designated as chairman, and two alternates, but in counties with only one community, five committeemen and two alternates are to be elected. Members are limited to four full consecutive terms.

County agricultural program committees are to consist of (a) community committeemen, (b) the county agent, who shall, however have no vote, and (c) a representative designated by each of such agencies concerned with soil, conservation, grass conservation, drainage, irrigation, or other agricultural interests as the State agricultural council may specify: however, the number of such members shall be at least one less than the number of community committeemen. The wording is somewhat obscure, but Report 1295 makes it clear that the Senate committee members have in mind representatives of soil conservation districts, etc. (Sec. 106).

County agricultural program executive committees (Sec. 107), composed of three to five members (as the state council decides)

[10] Amendments offered by Senator Wherry and adopted on the floor added to the Senate bill provisions for a national conservation survey and a land conservation and development survey; since these are essentially like similar provisions in the Hope bill, the reader is referred to the later discussion.

are to be elected from among themselves by the elected members of the county committees. Chairman, vice-chairman, and secretary are designated in the election. Terms are one year, and the limit is four full consecutive terms.

Section 108 provides for state agricultural councils. Ex officio members, without vote, include state Commissioners of Agriculture, and the Directors of Agricultural Extension and Experiment Stations, or their respective designees. In addition, four farmer members are provided, whose number may be supplemented, in the discretion of the state council, by two members, or by one additional member for each twenty counties (or major fraction thereof). Hence, Texas could have four plus 23 or 27 farmer members. Chairmen of the county executive committees meet to nominate, by majority vote, three names for each position on the state council. Not more than two of every three so nominated can be names of county chairmen. The Secretary of Agriculture appoints state council members from those so nominated. County members, moving up to the state council, must vacate county offices. Terms are for three years and are to be staggered. State council members are, in effect, to be limited to one term of three years, although, presumably, after a lapse of one year, they become re-eligible.[11]

Duties and Functions of the Agricultural Committees and Councils.

The State agricultural council shall develop plans to effectuate the purposes of section 7 of the Soil Conservation and Domestic Allotment Act in its State, shall perform the functions assigned to it pursuant to section 101 (c) of this Act and such other functions within its State as the Secretary may assign to it, shall supervise and direct the work of the county agricultural program and executive committees in its State, and shall otherwise cooperate with the Secretary in the planning and carrying out of soil conservation programs in its State. It shall elect from among its number a chairman, vice chairman, and secretary, and shall employ a State administrator and such other personnel as it may deem necessary to carry out its functions. In carrying out the functions assigned to it, and subject to the approval of the Secretary, it may enter into arrangements with (1) the Agricultural Extension Service in its State for the conduct of educational and demonstrational programs and (2) State agricultural councils of other States for cooperation on matters of mutual interest. Federal grants-in-aid for programs administered by the State agricultural council shall be disbursed by the appropriate agency of the State only pursuant to direction by the State agricultural council. Any grants-in-aid or other

[11] For all levels of committees, there are elaborate provisions for selection of alternates, filling of vacancies, etc.

funds allocated to a State for programs administered by the State agricultural council may be withheld or recalled by the Secretary if he determines that such council is not faithfully administering the programs assigned to it. (S. 2318; Sec. 108)

Specifically the duties of the county agricultural executive committee would be (1) to secure personnel to carry out such work as the Secretary of Agriculture through the State agricultural council assigns to it; (2) to see that this personnel performs the functions assigned to them; (3) to see that the present work of the Soil Conservation Service, the current operations of the Production and Marketing Administration Service, and other agencies is coordinated to prevent overlapping, duplication, and infringement of one agency upon duties of another; (4) to effect savings in administrative costs at the county level or to make needed services in the county more effective; (5) to recommend to the Secretary of Agriculture, through the State agricultural council, ways in which the county work can be made more effective in terms of better service, better use of personnel and emphasis upon phases of work most essential to the county. (S. Rep. 1295; p. 4.)

Administrative Expenses.

Funds for administrative expenses, are in accordance with established AAA procedure, to come from the monies that go to the state for soil conservation payments, parity payments, loans, other payments in grant-in-aid, etc. Apparently, the Secretary makes such payments on requests to the state and county councils. The bill is not clear on this point.

Originally, the Aiken Bill sharply limited the time which state council and county committee members could work, with compensation, the former to eight hours per week, the latter to four hours. The present bill provides for compensation of state council members for time actually worked at rates fixed by the Secretary of Agriculture and for compensation of the county agricultural program executive committee members from time actually worked pursuant to the direction of the state council and at rates fixed by the state council. Reasonable expenses are also to be remunerated. Apparently, a distinction is conceived between work of policy-formation character and administrative work:

No such member shall . . . be paid for performing any services in addition to his services as member for any such council or committee, but a member may resign as member in order to accept employment by a council or committee. (Sec. 109).

On this point, Report No. 1295:

This arrangement need not require that farmers elected to the county agricultural program executive committee or the State agricultural council serve in any capacity beyond that of a board of directors.

In short, the state and county committees may apparently elect either to hire administrative staffs or to do the administrative work themselves or to do some of both, subject, of course, to the direction of the Secretary of Agriculture. Community committeemen may be paid for services performed at the request of the county program committee, or the county executive committee, or the state council.

Finally:

> The Secretary shall make such regulations as are necessary relating to the selection and exercise of the functions of such councils and committees, respectively. A county agricultural program committee may, except as may be disapproved by the Secretary, accept, in addition to the amounts paid to it by the Secretary, funds from other public agencies to be utilized for agricultural purposes.

Title II—Amendments to the Soil Conservation and Domestic Allotment Act

ACP Payment Program

Title II amends and reenacts the agricultural conservation payment provisions of the Act of 1936 as amended. At present these payments are authorized only until January 1, 1949 but this act would extend this to January 1, 1951. The chief change seems to be that in carrying out the provisions of this section, in the continental United States, the Secretary is directed to utilize the state agricultural councils and county agricultural associations and executive committees created pursuant to the Agricultural Act of 1948, i.e., the present bill. In addition, the act attempts to empower the Secretary to share, clearly, in the decisions of the state agricultural council on what kind of conservation work should be paid for.

The limitation on total payments to individuals is set at $1000. With respect to conservation practices that are quite expensive and need to be worked out over a number of years the bill apparently provides that payments for four years for such long-term work may be concentrated in one year, as the farmer elects.[12] The bill also provides for considerable flexibility in the use of ACP payments for demonstration or experimental farms.

The Aiken Bill—Miscellaneous

Generally, funds authorized for extension are grants-in-aid subject to the same conditions as additional grants under the Smith-

[12] Section 204 (c) is somewhat unclear on this point.

Lever Act of 1914. Not more than two percent of such authorizations are annually available to federal extension. Additional appropriations are assigned to states under the formula of the 1935 Act, which requires no matching; but the new money is made available only to states which have taken advantage of previous acts for grants-in-aid to extension, including matching provisions under such acts. It is interesting that the Aiken bill avoids the problem of requiring transfer of funds from the Bureau of Agricultural Conservation and Improvement to the Extension Service by authorizing new money for extension.

As to research, Section 103 requires the Secretary to establish in the office of experiment stations a Division of Soil Conservation and Improvement, the federal end of the new research organization for soil conservation functions established under the bill. This division may receive three percent of new appropriations here authorized. The Secretary is authorized to make available to state and territorial experiment stations such sums as "he may deem appropriate. . . . " Sums here are for functions falling under authority of state stations under Section 101b, and are to be in addition to other moneys appropriated for experiment stations.

The remainder of the bill, some 25 pages, deals with parity and related matters.

Comment Upon the Aiken Bill

1. This measure attempts to formulate agricultural policy across the boards in a measure which, at least in its policy declarations, ranges from conservation and land-use, through price policy, distribution policy, and (in some respects) credit policy, to nutrition policy and the extension of social security to farmers. Although forced to retreat from some of the declarations, the Senate subcommittee, and particularly Senator Aiken and his advisers are surely to be commended for their recognition that the concomitant goals of agricultural policy should be considered together as well as in their inter-effects with non-agricultural policy. Politics rises to a high level when policy is addressed to numerous ends which are sought to be related to one another. Much of the tendency in recent years has been to splinter policy into commodity, conservation, credit policy, and the like. Backed by strong and interested groups and intent upon the realization of limited purposes, it is relatively easy for legislators to perform their function. The difficulty arises

in the effort to inject the kind of statesmanship into policy formation which persists upon looking at things as wholes—especially in the light of our governmental institutions which reflect a constitutional system, the genius of which is that final authority is not supposed to rest anywhere. Commentators should, therefore, the more appreciate the effort to write policy in general terms, so marked in the Aiken bill.

2. In this bill, the Land Grant Colleges are considerably strenthened. All information, demonstration, and educational work dealing with individual farmers as well as related research work generally is required to be routed through the Land Grant Colleges.

3. However, as the Committee amended the bill, doubts are left respecting the administration of public programs for soil and water conservation. These are discussed above under the heading: *The Soil Conservation Service under the Aiken Bill.* This portion of the present bill seems inconsistent with the previous requirement that educational work be routed through the colleges; what is important to note is that the inconsistency reflects basic disagreements as to organization, which disagreements are also reflected in powerful groups.

4. Hence, any legislation which is eventually passed is likely to have some basic inconsistencies which reflect the conflicts of interest without "resolving" them and which therefore leave the field open for continued pulling and hauling among interested agencies.

5. Another possibility under the proposed Aiken Bill is the effect on the organization of political power through the strengthening of the AAA committees. How important the committee structure is seen to be is indicated by the following quotation from Senate Report 1295:

> It is the intent of the committee that this type of organization will come to have a prominent place not only in administering the program now set forth in the bill, but to develop into an organization which will go much further in coordination of all agricultural programs. As this type of coordination develops it is believed that the Secretary will wish to give added responsibilities to the county executive committees and that they can help promote State agricultural activities that may be assigned to it.

The possibility of the AAA organization becoming an adjunct or a tool of organization of a political party has been recognized. The Hatch Act marked an effort to penalize such political action by public administrators, and the national agricultural council in the first Aiken bill was to be bi-partisan. But, apart from participation

in partisan politics, the pressure-group potential of the proposed committee system is still significant. It seems possible for the committee system to become a vigorous pressure group for the continuation of certain policies.

This development is by no means inevitable. It becomes progressively less probable, I think, under the relevant provisions of the Aiken bill. Thus the first draft of the bill, with its network of committees and councils, reaching from communities and counties, to states, and to the national council, provided for an administration of the AAA program which would probably have been impossible for the Secretary of Agriculture to control. This development seemed in recognition of the skeptical regard with which many farm leaders have held the Secretary, as the "President's man." Since the well-known Farm Bureau proposals of 1940 for board administration of the chief agricultural action program, numerous other suggestions have been to the same effect, i.e., to take important agricultural programs "out of politics" by hampering or, preferably, eliminating Secretarial control over them.[13] The committee draft of the Aiken bill, however, removed the provision for a national agricultural council. And as the bill passed the Senate, it provided for Secretarial appointment of state agricultural councils, from nominations of county chairmen. Moreover, the bill flatly states, regarding state council members, that "Farmer members shall be removable by the Secretary at any time." It is an interesting speculation that the increasing likelihood of political change may have caused the Republican Senate to be more willing to vest the Secretary of Agriculture with real administrative powers.

But if the judgment must now be modified that the Aiken proposals would strengthen the pressure-group aspects of the AAA organization as a fairly independent agency without clear responsibility to any recognizable political official, no legislation has actually been passed and the possibility remains. Even as the bill was accepted by the Senate, there may be doubts as to how the committee structure will be controlled. After 1938, appointment to state AAA committees apparently became the effective prerogatives of regional AAA directors; may not appointments to state councils actually be made by the Bureau of Agricultural Conservation and Development? State and county councils and committees

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[13] Cf. Hardin, "Political Influence and Agricultural Research," *American Political Science Review*, Aug., 1947, p. 674 and n. 9.

will apparently exercise considerable control over programs and will enjoy not a little patronage. Moreover, it should never be forgotten that this is the administrative organization for a program heavy with moral and emotional values. Within agriculture, at least, parity is not lightly challenged. If agricultural prices fall, support prices come into play, and acreage restrictions follow, there may well be a closing of ranks behind an "orthodox" agricultural program. The AAA organization becomes significant here in that it provides not only the administrators but also the expounders and defenders of this program. If the AAA organization interlocks with farm organizations, the Farm Bureau in many states, the Farmers Union in some, and the Grange in one or two—then a formidable holding company may emerge. This holding company may emphasize the orthodox program to the disparagement of proposals for change.

In appraising the possibilities of the development of such a system of administration as the vehicle for establishing the "orthodoxy" in agricultural programs, two other points should not be forgotten. First, the AAA committee system is the heritage of the 1930's. It was developed rather rapidly, and it may have been necessary at the time. Certainly, the AAA marked a radical departure in terms of what was expected of farmers as "cooperators." No doubt the acceptance of the AAA program was facilitated by the employment of farmer committeemen. However, the rationalization of this committee structure as the "two-way process" of "democracy in agriculture" should not be permitted to prevent present reconsideration of the whole administrative organization. It may be that a method and an organization which were well-suited to the early days of the program are now no longer satisfactory and should be replaced.

Second, in speaking of the development of "orthodoxy" one must not forget the very real conflicts of interest which tend to divide agriculture in the United States, for example, the conflict over margarine taxes, the conflict between dairy and hog farmers over corn as a feed, the conflict between range cattlemen and feeders, the friction between north central and southeast over support price levels, etc. It may be that such conflicts will have the effect of keeping any agricultural program fluid and adjustable because powerful groups will refuse to permit any one program to emerge which, in their judgment, discriminates against them. On the other hand,

through log-rolling, it may be possible to patch together a national adjustment program for agriculture which has the appearance of flexibility in that there are regional and sectional adaptations as well as provisions for special commodities—*yet which remains quite rigid and inflexible & in application in any given region.* As an example of sectional rigidity, one might cite the difficulties encountered by the AAA in trying to establish a different "corn belt parity" about 1941. As an example of log-rolling, one might cite the give and take in connection with the $212,000,000 for parity payments annually made available in the approximate period of 1938–1942.

6. It might be remarked that in programs for a planned agriculture, it seems extremely advisable to combine (a) an ability to act and get something done with (b) a recognition that the action taken is not necessarily morally right nor scientifically sound but is rather the best possible expedient *on which agreement can be had at the time.* Few immediate objectives are more important for the successful operation of democracy than this realization. It keeps skepticism alive even in the presence of vigorous and forthright action. It would seem that a policy of general legislation plus plenty of administrative discretion could be best combined with realization of the expedient character of action programs. In effect, then, Congress would be saying: The goals we want are fairly sure, but the means will have to be worked out as we go along. In this respect, the Aiken provisions revising parity, which were enacted to take effect in 1950, are admirable. Except for tobacco, basic commodities are supplied with moving price floors ranging from 50 to 90 per cent of parity. There is likewise broad discretion in the Secretary as to the level of support for nonbasic commodities. These provisions mark a welcome shift away from rigid support levels imposed under 1941 and 1942 legislation in that they acknowledge the exploratory, expedient, and *political* character of the program.

7. The Aiken bill fails to resolve the jurisdictional conflict between the SCS and the TVA. What we see in the Aiken Bill is a concentration of power at two levels, the national and the state, What room remains for a regional organization? One of the items in the declaration of policy is:

"(13) to provide for the adaptation of agricultural programs to the different and changing needs of regional and local communities. . . . "

However, this is only broadly permissive, and the Aiken Bill in its present form does not clearly provide for relating present regional agricultural programs (TVA) or potential ones (MVA, Arkansas River Valley Authority, etc.) to national agricultural policy. The recognition of the unified approach to resources which characterizes TVA was fully recognized in the original report of the Aiken committee[14] but has not been included in the present bill's statement of purposes.

III. THE HOPE BILL

If introduced to maximize the area of discussion, this bill's purpose is well-served.[15] From internal evidence, the bill, as its precursor, the Jensen bill, indicates considerable staff work by the SCS; however, the Hope bill would transfer several agencies from the Interior to the USDA. The primary aim of agricultural policy is declared as the conservation, improvement, and development of the nation's land and water resources; contrast the breadth of the Aiken bill.

Fact Finding and Declaration of Policy

A long statement entitled "Finding of Facts" acknowledges "the agricultural land and waters of the United States" as "this Nation's most basic resources. . . . " What are "agricultural waters" is not clear. The finding cites grievous wastage of resources and asserts the need of a national agricultural land policy where none now exists. Organization which rests upon the joint assumption of governmental and private responsibilities for conservation is called for.

Seven policy declarations follow. Conservation with all speed is provided. Integrated administration is posited for all public programs dealing with agricultural land and water conservation, except those of Indian Affairs and the National Park Service, Interior, and of the Tennessee Valley Authority. Two of the declarations indicate the influence of the SCS. Thus the land-use capability tables and the policy of treating each acre according to its needs are included in:

(3) to achieve the conservation, improvement, and development of the Nation's various agricultural lands by utilizing them in accordance with

[14] Senate Report #885, 80th Cong., 2d Session.

[15] First session, H. R. 6054, 30 March 1948, An amended version with the same number was introduced 9 July 1948.

their capabilities to produce and by treating them in accordance with their needs for conservation, improvement, and development . . . .

The SCS viewpoint is also seen in the emphasis upon the *distinct* elements in the approach (italics supplied):

(5) to recognize that research, education, technical operation, and material assistance, financial and otherwise, are *distinct* elements in conserving, improving, and developing the Nation's agricultural land and water resources. . . .

The Agricultural Resources Administration[16]

This agency is to have an administrator, selected and appointed by the Secretary with due regard to his knowledge of the land resources of the nation and of the necessity for the conservation, improvement and sound development of such resources.

Scope of the Administration.

It is responsible for fulfilling all policies relating to programs for conservation, improvement, and development of agricultural land and water resources as well as wildlife; but a provision calls for maximum use of existing federal and state agencies so far as education and research is concerned. The Agricultural Resources Administration has (a) an agricultural land service, (b) a forest service, and (c) a fish and wildlife service. The following are included: FS, SCS, ACP of PMA plus "all of the functions, powers and duties relating to soil survey, and to research functions in water conservation and soil physics, now exercised by the Bureau of Plant Industry"; plus "all other functions, powers, and duties of any agency or administrative unit of the Department of Agriculture having to do with the physical and chemical characteristics of soils, the classification of soils and lands as to their suitability for agricultural development and use, and the technical aspects and methods of soil and water conservation improvement and development"; plus Bureau of Land Management from the Interior except for functions respecting mining, mineral leasing, etc. (the BLM, set up a couple of years ago, includes the land office and the grazing service); plus the agricultural staff and planning functions of the Bureau of Reclamation;[17] plus Fish and Wildlife Service, Interior; plus responsibilities

[16] The Agricultural Resources Advisory Board is omitted in the July 9 version.

[17] The July 9th bill clarifies this provision. The USDA is clearly authorized to investigate and determine the agricultural feasibility of proposed projects, but reclamation is responsible not only for construction and administration of projects but also "for the final determination of economic . . . feasibility. . . . "

of the Farmer's Home Administration under the Water Facilities Act (1937).

Additional functions to be added

The President is ordered to determine within 120 days and to specify by executive order such functions of any and all other agencies of government primarily concerned with conservation improvement or development of agricultural land and water resources, or functions which if continued would substantially duplicate any function authorized to be performed by the Agricultural Resources Administration; exceptions here, Indian Affairs, Park Service, Interior, and TVA. The bill automatically requires the transfer to the Agricultural Resources Administration of all functions designated by the President.

Secretary of Agriculture Directed to Coordinate Departmental Policy with this Act

This part of the bill clearly erects conservation policy as the overriding policy for agriculture. This is so important as to require quotation (italics supplied).

SEC. 4 (a) The Secretary of Agriculture shall review and make an analysis of the programs and activities of *all* agencies, branches, and bureaus in or under the control of, or transferred to, the Department of Agriculture, *to ascertain to what extent,* if any, the *policies, programs, or activities of such agencies, are inconsistent with the policies expressed in this Act,* and *he shall,* within the limits of his statutory powers, *require that all such policies, programs and activities be carried out in a manner consistent with the policies established herein.*

(b) If the Secretary of Agriculture shall find that any policy, program, or activity of any agency or bureau of the Department of Agriculture is inconsistent, in whole or in part, with the policies expressed in this Act but that such policy, program, or activity is required by law or that he lacks legal authority to change such policy, program, or activity, he shall so report to Congress and shall suggest such legislative action as may, in his judgment, be required to permit him to carry out the provisions of subsection (a) of this section.

Powers of the Secretary

Section 5 grants effectuating powers to the Secretary, but these are limited by Section 8: that is, on any land not owned or controlled by the Secretary, these powers apply only with consent of the agency or person in control of such lands. (1) The Secretary is

broadly clothed with research and extension functions, including independent research and the power to conduct demonstrations "relating to the conservation, improvement, and development of agricultural land and water resources." (2) Conservation measures, very broadly conceived, may be carried out. (3) Lands or rights or interests therein may be acquired by purchase or gift, if necessary to carry out the act. (This grant of eminent domain is not limited by Section 8). (4) Technical assistance is authorized for federal and state agencies, including soil conservation districts; and cooperation with state and county planning bodies is provided, all to effectuate the purposes of the act. (5) and (6) These provide technical assistance for private land not within soil conservation districts, under such conditions as the Secretary may determine, and also for public lands.

Conservation Survey

Section 6 requires a conservation survey to be made as rapidly as practicable; all present and potential agricultural lands are included. Presumably, the survey is to extend SCS methods generally; thus the distribution of information about it includes "the furnishing of land use capability maps to land owners and operators . . . and assisting them in utilizing such maps."

It is essential to understand the effect this survey is to have. The survey is to designate lands according to their suitabilities, for cultivation, for forestry, for range livestock, and for wildlife; in addition, lands suitable for drainage, irrigation, etc., shall be designated. "*These determinations shall be utilized by all agencies of the Federal Government in the development of agricultural lands within their jurisdiction.*" (Italics supplied.)

Assistance

Section 9 authorizes the Secretary broadly to grant assistance to individuals or agencies to carry out the act.

> Such assistance may include, but is not limited to, financial payments, conservation materials, planting stock and seed, use of equipment, or other similar materials and aids: *Provided*, that in furnishing such financial or other assistance to any person with respect to lands situated within a soil-conservation district which meets the standards established by the Secretary of Agriculture, such assistance shall be made available only through, or in cooperation with, such districts.

(b) In providing such assistance the Secretary of Agriculture shall take into consideration—

(1) the recommendations of the governing bodies of soil conservation districts concerning the need for, and the capabilities of such districts to use effectively, the funds, materials, or equipment;

(2) the urgency and extent of the need for such funds, materials, or equipment to prevent irreparable damage to agricultural land and water resources; and

(3) the availability of technical assistance to assure the most effective use of such funds, materials, or equipment.

The emphasis on soil-conservation districts is noteworthy, as is the revealing use of the word, *irreparable.*

Payments

ACP Payments are divided into class A and B. Class A provides payments for practices, etc., of permanent or semi-permanent nature (terraces and the like). These payments are limited to an undesignated fraction of the cost as determined by the Secretary on "a generally fair and reasonable basis." They shall be made only once. Further, after 30 June 1951, Class A payments are to be made only "when such practice or improvement is carried out as part of a complete farm or ranch conservation plan, and . . . on the basis of a cooperative agreement between a soil-conservation or other conservation district and the landowner or operator. . . ." Class B payments are traditional ACP payments (liming, fertilizing, crop rotation, etc.); they may be made annually but shall not exceed an undesignated fraction of cost of performing such practice, as the Secretary determines.

Both A and B payments shall be classified according to such areas and practices as Secretary determines annually after he considers recommendations of governing bodies of soil conservation districts. In order to qualify for Class A payments[18] a farmer has to be in a soil conservation district, have an agreement with the district and have the district through its governing body certify not only that the practice meets the standards under the act, but also that the work has been performed as part of a complete conservation plan. These certifications by the governing body of the district are made

[18] The 9 July version of the bill provides that prior to 30 June 1951, Class A payments may be made outside of soil conservation districts, subject to terms of the Secretary.

through AAA Committees, which, however, merely certify to the Secretary of Agriculture what the soil conservation district has already determined.[19] On Class B payments certification is the same if they are made to farmers in soil conservation districts, i.e., to land-owners or operators, but they may also be made outside conservation districts if certified by the AAA Committee.

Conditions for the Extension of Benefits Under the Act

Benefits under the act may be extended to lands owned or controlled by the United States, e.g., Park Service, Indian Service, if these agencies cooperate. Respecting lands not owned or controlled by the United States, the Secretary may, insofar as he deems necessary, require

"(1) the enactment of reasonable safeguards for the enforcement of State and local laws imposing permanent restrictions on the use of such lands and otherwise providing for the conservation, improvement, and development thereof;

"(2) agreements or covenants as to the permanent use of such lands; and

"(3) contributions in money, services, materials, or otherwise, to any operations conferring such benefits."

This quotation is taken almost word for word from the basic legislation of the SCS, namely, Soil Conservation Act, of 1935, 49 statute, 163, section 3, subsection 1.[20]

Section 13 provides for a Land Conservation and Development Time-Table[21]

The Secretary is to present this table to Congress along with the results or from the results of the survey set forth in Section 6, already noted. Costs are estimated and provisions for modifications on the basis of new findings are included. SCS has been recommending such time-tables in recent Congressional Hearings. There is an assumption of omniscience as to the rate that we must move to

[19] Section 22 repeals the Soil Conservation and Domestic Allotment Act, except for Section 8 (b) which establishes local, county, and state committees, but as the above indicates, the conservation function of such committees is henceforth strictly limited.

[20] The County Agricultural Program Boards, provided at this point in the original bill, are omitted in the July 9th version.

[21] Remarks under this heading are equally applicable to similar sections added to the Aiken bill on the Senate floor.

conserve our land, or else suffer ruin. Such time-tables, given the authority of legislation, can develop into powerful propaganda techniques, One is led to ask, why not similar time-tables for (a) wiping out malnutrition, (b) removing inequalities in education, (c) doing away from the major health hazards, and defeating the chief diseases, (d) eliminating monopoly, (e) achieving adequate housing, (f) replanning cities, (g) adjusting man-resource ratios, and finally, (h) resolving intergroup and interracial hatreds? These and other purposes are among those of a democratically organized society, but their very statement invokes disagreement as to the nature of our goals, the speed and method of their attainment, and priorities among them. It is the problem of any political society to decide upon which of these or other purposes it wants to achieve. The purposes have to be measured against each other. And while confusion may arise from insisting upon consideration of many purposes at once, there is greater danger in the erection of one or two major purposes into overriding social goals.

The Hope Bill—Miscellaneous Provisions

Section 15 authorizes such appropriations as Congress deems necessary from time to time. Setting aside funds for conservation payments, a minimum of five per cent of other funds appropriated are earmarked for research. Section 16 authorizes an undesignated amount annually for extension work, of which the Secretary is authorized to allocate such funds as he deems necessary to state extension services

> that have entered into memoranda of understanding with conservation districts, meeting standards established by the Secretary of Agriculture, covering the orderly conduct of educational work in conservation.

Since the USDA is already authorized in the bill to conduct educational and demonstrational work under the Agricultural Resources Administration, one wonders what would be left the state extension services to do with this appropriation.

Other agencies, specifically the TVA, the Office of Indian Affairs, and the Park Service, performing functions with respect to the conservation, improvement, and development of any agricultural land or water resources

> shall cooperate with the Secretary . . . so that such functions may, so far as practicable, be carried out in accordance with the declared policy of this Act. (Section 19).

Comments on the Hope Bill

Since a number of comments have been made in passing, they will not be repeated. Two points may be briefly made.

1. The writer construes this bill largely as (a) a delaying action on part of Congressman Hope, and (b) an effort to insure that reorganization for agriculture shall be debated in light of concrete proposals which embrace the widest range of possibilities. Cogent reasons for the advisability of both these can be found.

2. The influence of SCS is pronounced in the Hope Bill. In like manner, the Hope and Aiken field hearings in 1947 were full of planned testimony in support of particular agencies, especially PMA and SCS. Yet Congressmen, knowing that the hearings were, in a sense, "stacked," apparently came away favorably impressed. At the same time, manipulation of public opinion by public agencies and their "private" allies is not confined to agriculture; civilian agencies have a long way to go to rival the exploits of the armed services in this field!

Does "realism" then impel us to accept as inevitable the monopolization of the policy-forming process by public agencies and their allied private groups and associations? It seems that we should at least study what is happening. First, legislative proposals of agencies should be carefully examined as to their effect in aggrandizing the agencies themselves—and as to their effect upon the numerous goals of agricultural policy. Second, the techniques of lobbying should be fully disclosed,[22] as should be the alliances and counter-alliances, and the manner of creating and maintaining these. Rigorously limiting the scope of the inquiry to the controversy over soil conservation policy and administration, this means not only analysis of SCS and its allies, but of the PMA, the TVA, the fertilizer industry, and (since the major alternative to present administration is to assign SCS functions to the Extension Service), of the relationships between Extension and the Farm Bureau.[23] Initially descriptive, this analysis should aim at the eventual disclosure not only of the patterns of influence which are emerging but at the significance of these patterns of influence for the content of

[22] For interesting material on the methods of the SCS, see "Soil Conservation," *Hearings*, Com. on Agric., H. of R., 80th Cong., 2d Sess., March 1–5, 1948, pp. 68–103; also *Cong. Record*, Je. 22, '48, A 4520 (Daily Ed.).

[23] A recommendation to end the legal tie-up between Farm Bureau and Extension has just been made by a committee jointly representing the USDA and the Land Grant Colleges. See *Joint Committee Report on Extension Programs, Policies, and Goals*, Aug., 1948, Washington, D. C.

agricultural policy—and even at their significance for the future organization and control of political power in this country.

3. Finally, the emphasis upon soil and water conservation found in the Hope Bill needs reiteration. There are other ends of agricultural policy, such as farm family living, which many would hold to be superior to conservation as such. To be sure, Congressman Hope is reported readying other measures for legislative action; yet the present bill has to be evaluated for what it now offers. And there can be no gainsaying that it *does* erect soil and water conservation and development as *the* paramount agricultural policy for the country.

IV. PROPOSALS OF THE SECRETARY OF AGRICULTURE

These proposals were set forth in October, 1947; they have more recently been reiterated; presumably, Secretary Brannan indorses them.[24] Secretary Anderson presented the following recommendations:

1. "The establishment of a farmer-elected USDA county committee in each county."

These committees would have responsibility for the development of county conservation plans, approval for the requests of soil conservation districts for assistance, determination of farm acreage allotments and farm marketing quotas when these programs are operating, certification of eligible applicants for Farmers Home Administration loans, etc. Elected by the farmers of the county (farmers not being defined), the committees would have more than

[24] Perhaps for the first time, the relevant committees in the House and Senate held joint hearings. The USDA had been preparing material for some time. Several committees, composing a "work-group," under Mr. Brannan's chairmanship, were formed in the USDA's Program and Policy Committee (which was formed in 1947 and is composed of agency heads, but which has not been very active, according to reports.) "Some 200 individuals have given attention to this work over and above their regular duties." Nevertheless, opportunity had lacked "to discuss these proposals with our field staff and local farm leaders. . . . " The work-group was composed of the following committees: Conservation and Land Use Adjustment Policy, O. V. Wells, Chairman; Technological and Economic Research, W. V. Lambert, Ch.; Rural Facilities, Services and Industries, Claude Wickard, Ch. (actually, Mr. Brannan took over this testimony in a session which produced fireworks over the sanitation of typical farm homes, etc.); and the Price Policy and Production Adjustment Committee, C. C. Farrington, Ch. Discussed here is the administrative framework for conservation policy, with respect to which O. V. Wells' group provided an analysis of the approach. *Hearings*, Long-Range Agricultural Policy, Sub-committee, Committee on Agriculture and Forestry, Senate, and Committee on Agriculture, H. of R., 80th Cong., 1st Sess., Oct. 6–8, 1947. Reaffirmation may be found on p. 16 of *Hearings*, Senate Committee on Agriculture and Forestry, Agricultural Act of 1948, 80th Cong., 2d Sess., Apr. 12–23, 1948.

advisory function; they would have "specific responsibilities." Secretary Anderson stated:

> The county committees would provide assistance in developing local agricultural programs and in relating Department of Agriculture activities to local needs. They would correlate local programs with national food and agricultural objectives. They would assist the Secretary of Agriculture in the coordination and integration of the facilities of the Department at the county level. With the concurrence and participation of the land-grant colleges, the county committees could coordinate the work of the Federal agencies in the county and the related activities of the cooperative extension service in the county.

2. All agricultural agencies in the county should share the same building to the cost of which Congress should contribute.

3. Establishment of USDA committees in each state. Secretary Anderson suggests a membership of seven: the Commissioner of Agriculture, a representative of the Land Grant College, and five farmers who might either be chosen by the Secretary of Agriculture or elected by the county committees—or selected through some combination of these.

4. The ACP and SCS programs should be combined and administered by one agency.

5. Congress should provide for an additional assistant Secretary of Agriculture "to whom the Secretary could assign national responsibility with respect to the State and county USDA committees." This officer might become integrator of all USDA programs in counties.[25]

Comments on the Secretary's Recommendations

First, as is customary, Secretary Anderson's recommendations, however "right" they may be, are in the interest of the Department as against (a) the states rightism of the Land Grant Colleges, (b) the behind-the-scenes disposition of power and influence by pressure groups, and (c) the development of effective internal power by relatively autonomous USDA bureaus (which tend to stultify *departmental* decision and action in favor of *bureau* decision and action). If the recommendations at the county level were effected, the USDA would likely be strengthened considerably in the eyes of the farmers. Again, the line from the USDA to the counties is to be perfected, with a special assistant secretary of agriculture,

[25] The Secretary also endorsed recommendations for forestry policy and for western public lands and irrigation policy.

and with state committees which, to whatever degree the secretary selects their personnel, are, in any event, not to be subservient either to farm organizations or the Land Grant Colleges. Thus the Land Grant Colleges have only one member, who is *appointed* by the Secretary and does not serve *ex officio*. This means that the Secretary in many states can choose among two or three men at the college—Director of Extension or of Experiment Station, or the Dean, for example. This might mean (a) that since the same official does not automatically serve—e.g., Extension Directors in each state—it would be less easy for the college members of the various state committees to use their well-established professional associations as platforms to build nets of understandings and agreements against Washington. (b) It also might mean that the Secretary could choose the college man who was most kindly disposed toward the USDA, more amenable to Washington leadership, less of an intransigeant states righter, or less independent of Washington meddling—several tags are supplied here as in a cafeteria so that each reader may select the one he likes best.[26] (c) It also may mean, most importantly, that the State Extension Services are going to be kept from dominating the programs.

Again, in placing state commissioners of agriculture on the committee, Secretary Anderson may not merely be "rounding out the membership." In a number of states there has been some friction between state departments of agriculture and the Land Grant Colleges; the commissioners may neutralize college influence.

Second, the Secretary's proposals are certainly in skeleton form. Take the county committees: who are to be electors? What will be the relationship between these committees and the county agent, county governments, soil conservation districts, and REA (and other) cooperatives? What discretion is going to be granted to states and counties respecting the choice of these committees? Are the committees to be paid; if so, how much, and how financed? What staffs will they have, and what will be the means of finance? Or take the ACP combination with SCS into one agency and one program. Just how? This has been tried before (in 1941–42—the Agricultural Conservation and Adjustment Administration), unsuccessfully.

[26] The Secretary of Agriculture might be accused of manipulating the college by this power to pick and choose. This is a delicate question. A situation might arise in which the Secretary could be charged with undue meddling. Contrarily, in some states college officials may become so thoroughly intrenched as to be jarred loose only by some outside force.

THE ECONOMICS OF ROTATIONS WITH FARM AND PRODUCTION POLICY APPLICATIONS*

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A GREAT deal of recent debate has centered around rotations in general and the forage enterprise in particular. Conflicting observation and analyses have been made at both the farm and policy levels. Although this is an important problem area in which society as well as the individual has an important stake, these issues have nowhere nearly been settled. If the social product is to be maximized from the given stock of resources, it is important that the "correct" alternative be selected from within the extremes put forward. Similarly the individual farm business in its attempted profit maximization is torn between conflicting observations. Finally, the question poses a somewhat unique situation in the theory of the firm which, although of important magnitude in the agricultural industry, has not been thoroughly analyzed in the pure economics.

For these reasons the rotation and forage enterprise has been lifted from a complex environment for examination of certain of the numerous facets in this paper. By drawing on existing knowledge of physical transformations and accepted production theory it is possible to clarify the economic position of the forage enterprise. In this paper we attempt to accomplish several objectives: 1. to provide the conceptual solution of the problem by refining models from the existing chest of economic tools; 2. to reconcile some of the conflicting observations relative to the economic role of the forage enterprise, 3. to indicate further some income and efficiency consequences of conservation programs, production control, or extension of a food emergency goals. The analysis refers mainly to the Corn Belt where hay and pasture are employed in rotation with feed grain crops. The same general principles are applicable elsewhere.

In order to facilitate the analysis the crop enterprise has been considered apart from the livestock enterprise. Grain and forage crops rather than livestock are considered as the end market products. In a sense this procedure ignores some important relationships. However, the general analysis remains the same.[1]

* Journal Paper No. 1609 of the Iowa Agricultural Experiment Station, Project No. 976. This paper has benefitted from the comments of Carl Allen, Lee Day, Carroll Hess, Harold Jensen and Bob Worcester.

[1] The two considerations which are important in the solution of the problem

The Analytical Tool

The problem is basically one of choice of output of different products (forage and grain) from a given outlay of resources (a constant cost) and the appropriate tool of analysis is an iso-factor or iso-cost curve. An iso-factor (iso-cost) curve indicates the various combinations of two products possible from equal or given factors (costs). Accordingly, the general solution is presented below in terms of the equilibrium or most profitable output combinations of the two products—commodity Y (grain) and commodity X (hay)—from a given input of resources or costs (given input of current expenses, land, labor, capital, etc.) The model will be related to rotations and

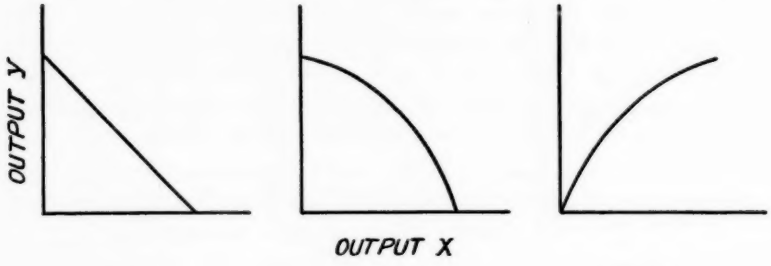

FIG. 1 FIG. 2 FIG. 3

the forage enterprise subsequently. As a step to the general solution some basic production or enterprise relationships are presented first.

Numerous enterprise relationships are possible when given resources can be used to produce two or more alternative products. Figure 1 indicates a case in which the two commodities X and Y are (1) competitive—if more of X is produced from given resources (costs), less of Y must be produced and vice versa, and (2) substitute for each other at a constant marginal rate—an increase in output of X by one unit requires a constant decrease in output of

in terms presented here are, 1) price relationships of forage and grain (other) crops and 2) the marginal rates of substitution of grain and hay as products from given resources (iso-cost curves). The analysis might be presented in a similar vein by considering grain-consuming versus roughage-consuming livestock (including the possibility of various grain roughage combinations for a given output and type of livestock products) as the end market product. The considerations necessary in solution then include, 1) price relationships of forage-produced and grain-produced livestock, 2) marginal rate of substitution of grain-produced and roughage-produced livestock from given resources, 3) marginal rate of substitution of grain and roughage as products from given resources, 4) marginal rate of substitution of grain and hay as inputs for a given type of quantity of livestock products.

Y throughout and vice versa. The curve or line is an equal or iso-factor (iso-cost) curve since it represents the various combinations of X and Y which can be produced with equal or given factor (cost) inputs. The slope of this iso-cost (equal cost) curve indicates the amount of X which substitutes for a given amount of Y without changing total costs. Obviously a large number of output combinations is possible between the extremes of producing all of X or all of Y.

Figure 2 indicates the iso-factor case when the two enterprises are (1) competitive—an increase in output of X is possible from given costs or resource input only if output of Y is decreased and vice versa, and (2) substitute for each other at a diminishing marginal rate—as output of Y is sacrificed to increase output of X, increasing quantities of X are required to replace each successive decrement in Y and vice versa. (The sharper the slope or curvature toward the $X(Y)$ axis, the lower the marginal rate of substitution of X for Y (Y for X)—the greater the number of units of $X(Y)$ necessary to replace the unit of $Y(X)$ sacrificed.)

Figure 3 illustrates the case when the two enterprises are strictly complementary—the greater the output of product X from given costs the greater the output of Y product which is also forthcoming, (and vice versa if the two are mutually complementary). This iso-cost (or iso-factor) curve simply indicates that as output of one product is increased, output of the other is also increased from given resources. In the case presented, X is complementary with Y at a diminishing marginal rate (a given increase in output of X is accompanied by smaller and smaller increments in output of Y).

A fourth possible relationship between enterprises (produced from a given or constant quantity of resources) exists. Here the two products must be produced in fixed proportions (joint products from a single production process.) Accordingly, the iso-cost (or iso-factor) curve reduces to a single point and the marginal rate of substitution is zero.

Profit Maxima

Given these product or enterprise relationships, some general statements can now be made about profit equilibrium (the allocation of the given resources between the two possible products which will maximize net returns). To simplify the exposition and

to retain the problem as one of enterprise combinations, it is taken as given at this point that the total revenue (gross income) is greater than the given total cost in all cases. This allows analysis of the most profitable output combination alone without bringing in still other distinct problems (such as whether it is profitable to produce any of either or both products). Yet it allows the most profitable output combination to vary between the extremes of all X or all Y depending on price relationships and the marginal rates of substitution.

The solution is readily apparent in case 4. Since the two commodities must be produced in fixed proportions, this single combination is automatically the most profitable. This relationship (joint products in fixed proportions) does not exist in agriculture and is unimportant in our analysis of the rotation and forage enterprise.

There is no equilibrium combination of the two products (for a competitive business firm as is true in agriculture) within the complemenatry range for case 3. Since the iso-cost curve represents the combination of the two products possible from a given or constant total cost, total revenue and net income will increase continuously as output of either product is expanded (since output of the other also increases). Furthermore, the relationship of prices is unimportant in this area. It is profitable to increase output of both products even if the price of one is as low as zero. There are but few examples in which this strict complementary relationship exists in any industry and none in which it extends indefinitely. It is, however, of fundamental importance in the forage problem (and other rotation situations) under consideration here. These implications are brought out at a later point.

Case 1 is best illustrated by two crops which are competitive within a rotation and require identical quantities of resources and timing of operations. To facilitate the analysis we will consider two enterprises, "barley" and "oats," as "substituting at a constant rate." What is the most profitable output combination of these two enterprises when the yield is, for example, 40 and 50 bushels per unit of resources for "barley" and "oats" respectively? Two alternatives exist.[2] 1. The given resources will be devoted, a. entirely to

[2] The analysis has been in terms of iso-costs or equal costs—the output combinations possible without changing total costs or input of factors. We will relax our conditions at a later point by replacing our consideration of an iso-cost curve to an iso-land curve and thus allow variations in expenses other than the land.

production of "barley" and none of "oats" if the price of the former is anything more than 1.25 as great as the price of the latter or, b. entirely to production of "oats" and none of "barley" if the ratio of the price of "barley" to the price of "oats" is less than 1.25. 2. Any combination of "barley" and "oats" (including production of all of one and none of the other) will be equally profitable at a price ratio of exactly 1.25 (an indeterminate equilibrium). These possibilities will hold since the marginal rate of substitution is constant throughout at 1.25 units of product X ("oats") for one of product Y (barley). This case (competitive products and a constant marginal rate of substitution) is best represented in the corn-small grain-forage by competition between the small-grains which vie with each other for the position as nurse crop. On some soils the competition of forage with grains is perhaps also of this type (the implications of which are pointed out later).

Case 2 is numerous in all industries and is especially important in agriculture (and in forage crop production). It is, of course, the case of joint products which can be produced in varying proportions. It is also the case for many or most competitive products which are not joint products in the sense that they are forthcoming from a single production process. Although both are competitive relationships, the equilibrium or most profitable combination of enterprises is more complex in this than in case 2 because of the diminishing marginal rate of substitution of X and Y products. Total revenue (and hence net income since cost is constant) can be maximized at only one output combination. This equilibrium exists when the ratio of prices of the two products is (inversely) proportional to the ratio of substitution of the products.[3] This can occur with a single combination (in contrast to the indeterminate situation of case 3) since the products substitute at a diminishing marginal rate. It is the ratio of prices and the marginal rate of substitution which provide the solution in any instance.

[3] Suppose that in figure 2 the marginal rate of substitution of X for Y (units of X gained with sacrifice of one unit of Y) at points D, E, and F is 3, 2, and 1 respectively. (The rate of substitution of Y for X is 1:3, 1:2 and 1:1) with a price of $2 for Y product and $1 for X product it is obviously profitable to substitute X for Y at point D—(since in giving up $2 in Y a gain of $3 of X is realized). At the equilibrium point E, a substitution of X for Y results in a sacrifice of $2 in Y and a gain of $2 in X. At a price of $1 per unit for each X and Y the equilibrium will occur at point F. Obviously it is a necessary condition that the two must be inversely proportional at the point of equilibrium (profit maximization): If 1 unit of X substitutes for 3 units of Y (substitution ratio=$1X$:$3Y$), then equilibrium can exist only if the price of Y is three times greater than that of X (price ratio=$3Y$:$1X$).

Application to the Forage Enterprise

The models presented can now be applied specifically to rotations and the forage enterprise by drawing on existing knowledge of production relationships and profit maximization criteria. Our analysis is in terms of the Cornbelt rotation which includes legumes and other hays in combination with grain and which results in the production relationships discussed here. In this rotation and region (or other regions of the nation where rotations including hay or pasture play a similar part) the role of the forage crop is not ade-

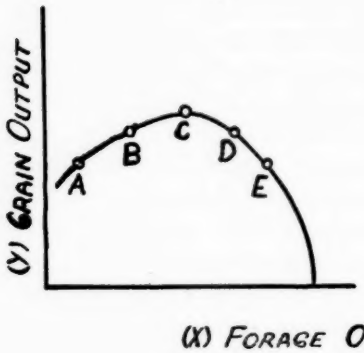

FIG. 4

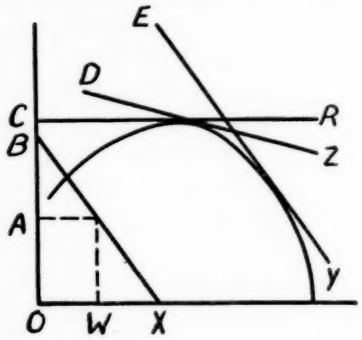

FIG. 5

quately expressed by any single model discussed. Instead it is best expressed by a combination of figures 2 and 3. This results in a relationship (iso-factor curve) between grain and forage enterprise such as the model expressed in figure 4. A complementary range first exists and grain output (Y axis) increases as hay acreage and output (X axis) is increased. This complementary range exists where the increased hay in the rotation augments total grain output (corn plus small grain) by 1. increasing fertility through nitrogen added by legumes, 2. improving soil structure through addition of organic matter, 3. preventing soil erosion and, 4. controlling insects, diseases, and pests. Total grain production increases with expansion in hay acreage and output as long as the percentage increase in per acre yield of grain in greater than the percentage decrease in acres of grain (the elasticity—percent increase in acre yield divided by percent decrease in grain acreage—must be greater than 1.0).[4] The

[4] The grain output ordinarily included corn and small grain in the forage rotation. This distinction is not made in the analysis of this paper. The term "grain"

competitive range is initiated at the point (C in figure 4) where the percentage increase in grain yields per acre is less than the percentage decrease in grain acreage. Beyond this point an increase in acreage and output of forage results in a smaller total output of grain.

Experimental data suggest that the degree of complementarity is at a diminishing marginal rate—each unit increase in forage acreage (and output) is accompanied by a smaller and smaller increment in grain output. (As the rotation is changed, for example from continuous corn (all grain) to a corn-corn-oats-meadow to a corn-oats-meadow rotation including 0, 25 and 33 percent respectively of the land devoted to forage, smaller increments in soil nitrogen content, soil erosion control, etc. occurs). Too, experimental observations suggest that forage substitutes for grain at a diminishing marginal rate somewhere in the competitive range since 1. grain yield per acre increases at a diminishing rate (for the reasons previously suggested) and 2. hay yield per acre may decrease as a greater percentage of the land is devoted to forage (a given area of land in meadow for a greater number of successive years) because of older stands, winter killing, exhaustion of soil moisture and plant diseases and pests. (The iso-curve will tend to flatten out or become a straight line at any point where grain yield per acre reaches a maximum in the competitive range and if these factors do not reduce per acre yield of forage—a tendency toward a constant marginal rate of substitution.)

Further examination of the equilibrium or most profitable acreage (output) of "hay" or combination output of hay and grain is now possible. Again, referring to the model which illustrates the grain-hay output combinations possible from given costs, it has been established that a competitive business unit cannot maximize returns by producing an output of hay short of that which marks the outset of competitive range (point C in figure 4). (See discussion

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refers to all grains. It is, of course, true that the prices per pound for these crops may differ slightly. However, in the subsequent analysis discussion of price relationships refer to all grain. If the rotation is increased to include a greater proportion of oats than corn, then grain production must include the tonnage of the two crops together and the price per pound or ton of all grains will average lower (as oats are substituted for corn) if the per pound price of oats is less than for corn. The distinction could be included but would add to the length of the discussion. The "solution" is exactly the same in either case. Historically oats have sold at a slightly higher price per pound than corn. An examination of rotation data indicates that the same rotation would ordinarily be selected were all grain (oats) considered at the corn price.

of case 3.) An increase in hay is always profitable (in terms of the iso-cost curve) within the complementary range since it is accompanied by an increase in total output of grain from given resources or costs. Again, the price of hay relative to grain is irrelevant within this range (for a competitive firm which must sell its entire output at market price—and the majority of farms fall in this category). Even if the hay (or pasture) must be sold at a zero price, an increase in hay output and acreage is still profitable. (See discussion of case 3.) The contribution of the forage enterprise to profits of the business cannot be measured by returns from this enterprise alone.

The relationship of grain and hay prices takes on importance immediately within the competitive range. The most profitable acreage of hay (combination of grain and hay output) now depends on two factors: 1) the ratio of hay to grain prices and 2) the marginal rate of substitution of hay and grain. (See discussion of case 2.) The higher the ratio of hay to grain prices or the higher the marginal rate of substitution of hay for grain, the greater will be the acreage and output of forage relative to grain which will be profitable. If either 1) the ratio of substitution of hay for grain, or 2) the ratio of forage to grain prices is great enough, forage alone will be produced (a grazing area). If these relationships are reversed, grain and hay output will be combined (for profit maximization) at that point which separates the complementary and competitive ranges (point C in figure 4). A constant marginal rate of substitution between grain and forage within the competitive range will result in one of two possible equilibriums, 1) all forage or 2) forage and grain combined at the point separating complementary and competitive ranges.

Iso-Revenue

Equilibrium is illustrated geometrically by figure 5 as a useful refinement. Readers interested in only the direct farm application may wish to skip this section. The straight line (curve) *BX* is an iso-revenue curve. It is also an iso-quant (equal quantity) since it represents all the various combinations of "forage" and "grain" which can be marketed to bring in a given revenue (or equal revenues). (As is also true for *DZ*, *EY*, and *CR*.) The iso-revenue curve is always linear (a straight line), for a competitive firm. For the "grain-forage price relationship represented by *BX*, a given income

(or equal incomes) can be obtained by the output combinations of 1) an output of *OB* "grain" and no "forage." 2) An output of *OX* "forage" and no "grain." 3) An output of *OA* "grain" and OW "forage," or any "grain-forage" combination in between these. The higher the iso-revenue curve, the greater the total revenue represented. (Line *EY* represents a greater revenue than *BX* but the price relationship is the same since both have the same slope. The iso-revenue line *DZ* represents a higher ratio of "grain" to "forage" prices than *EY* since it has a lesser slope.)[5]

The maximum gross (and net revenue) possible from given resources (costs) is denoted by the highest iso-revenue curve consistent with the iso-cost (factor) curve. This maximum profit (for a given price relationship) can be denoted only by the one *iso-revenue* which is tangent to the iso-factor curve. This point of tangency also denotes the most profitable output combination of "grain" and "forage." This condition is necessary for maximum revenue since 1) price and substitution ratios are equal only at the point of tangency,[6] 2) an iso-revenue curve higher than any point on the iso-cost curve represents an income higher than can be attained with the given input of factors, and 3) an iso-revenue curve lower than the point of tangency (one which intersects the iso-cost curve at any point) represents an income lower than possible from given resources.

Obviously, profits cannot be maximized by any output combination of "grain" and "forage" corresponding to an iso-revenue curve (*BX* for example) which intersects the iso-factor curve within the complementary range. An increase in output of "forage" which is accompanied by an increased output of "grain" will always correspond to successively higher iso-revenue curves (greater income regardless of the relationship of "grain" and "forage" prices.

If the price of "forage" is zero, the iso-revenue curve becomes a horizontal line such as CR. This is true since any quantity of forage varying between zero and infinity can be combined with the quantity of grain necessary to result in a given revenue (for any one

[5] The slope of the line is indicative of the "grain-forage" price ratio. An increase in "grain" price relative to "forage" price will lessen the slope (flatten the line) of the iso-revenue curve representative of given revenue. An increase in "grain" price with "forage" price remaining constant will lower the amount of grain necessary to bring the income implied by BX but will still require sale of OX "forage."

[6] The marginal revenue (from a given input of factor) for "grain" is exactly equal to the marginal revenue of "forage" at this point. The rate or ratio of change of two lines can be equal only at the point where their slopes are equal.

"grain" price). An iso-revenue curve lower than CR would not represent maximum revenue and the most profitable "forage-grain" combination (it would intersect the iso-cost curve). The most profitable "forage-grain" combination with a zero price for forage (a horizontal iso-revenue curve) must always occur at a maximum grain output. Tangency of the iso-cost and iso-revenue curves can occur only at the apex of the latter as is illustrated with the curve *DR*. "Forage" output will be expanded in the complementary range regardless of price.

Price relationships become important immediately in determining either "forage" or "grain" output within the complementary range, however. With a price greater than zero for "forage," the "forage-grain" output equilibrium is determined, by 1) the ratio of prices and 2) the marginal rate of substitution—the exact nature of the iso-factor curve. If the price of "grain" is high enough relative to the price of "forage," the equilibrium will still occur near a maximum grain output (as devoted by the iso-revenue *DZ*). A high price for "forage" relative to grain will result in a profit equilibrium with an output of all "forage" or a combination "grain" and forage output as suggested by the revenue iso-quant *EY*. (A zero "grain" price and a greater-than-zero "forage" price would result in an output of all "forage" and no "grain." The iso-revenue curve then becomes vertical and is tangent to the iso-factor curve only at this point.)

Time Span

Thus far no mention has been made of the time span or economic horizon which is relevant. The discussion relating to figure 4 referred to a time period in which the full effects of a rotation could be reflected in yields through either an increase in soil fertility or a decrease in soil erosion or structural deterioration. This is the situation which faces the owner-operator with a near-full equity in his business. Not all operators are able to formulate income expectations over a time span of this extent. The operator with a small equity in his resources and highly concerned with the possibility of loss from a given price decline or the tenant with assurance of only a brief stay on the farm is likely to attempt maximization of returns over a shorter time period. Accordingly the range of complementarity between forage and grain enterprises tends to be contracted

the shorter the time period. Within a given year there is often no complementary range, and forage is competitive throughout with grain—the more hay produced the smaller the output of grain possible within a given year since the effects of the hay in the rotation can be reflected in grain yields only over a period of years. The tenant (or bankrupt owner) who must move at the end of the year is faced only with the competitive relationship between hay and grain and acts accordingly in curtailing hay and pasture acreage. The iso-cost (iso-factor) curve then appears to the operator in the form of figure 2 alone and grain/hay price relationships are important immediately.

Monopoly Equilibrium

This section deals with the maximization of returns for a monopoly firm. It is not the case common to agriculture. It is included, however, because of its analytical interest and because it has certain implications for agricultural control programs.

Under conditions of competition, the elasticity of demand (for either "forage" or "grain") has no effect in establishing a profit equilibrium within the complementary range. Since the firm is faced with an infinitely elastic demand (must sell all of its output at a given price and cannot affect market price by altering its output) for either "grain" or "forage," the most profitable combination output can never fall within the complementary range. This is true regardless of whether the aggregate or industry demand is elastic or inelastic for either or both commodities.

The situation may differ for a monopoly firm however. Elasticity of aggregate demand becomes a determining factor within the complementary range. (The firm is faced with a demand of less than infinite elasticity.) Given the iso-cost curve of figure 5, total revenue and net return will be maximized at the point where marginal revenue becomes zero (demand becomes inelastic) since costs are constant. Marginal revenue for the combined output may become zero within the complementary range only if the demand for both commodities becomes inelastic at an output falling within this range. Otherwise, output of the commodity with the inelastic demand would be withheld from the market at the point where its elasticity becomes less than unity (if the demand for the other is elastic). An inelastic demand for forage (within the complementary

range) would result in an output combination falling at the apex of the iso-cost curve (with grain demand elastic). If demand for both "grain" and "forage" is elastic, the equilibrium combination will fall at or in the competitive range (whereas it must fall at or in this range for a competitive firm irrespective of elasticity of aggregate demand) depending on the price and substitution ratios.[7]

The discussion of monopoly equilibrium has important implications in control programs such as the historic A.A.A. which allowed substitution of forage for grain in rotation. Undoubtedly the program resulted in general improvement of the "social rotation" where it cut across the institutional rigidities which restrict product relationships to a competitive range alone on many farms. (It was inefficient in the respect that a constant reduction took some farmers only part way up the complementary range of figure 4 and others too far over into the competitive range.)

From a monopoly income standpoint, however, the monopolist would have moved in the opposite direction had he expected that 1) the demands for both grain and "forage" were inelastic and 2) that the program would have lasted long enough for both the complementary and competitive aspects of rotations (the full iso-land curve) to be reflected. He would have favored a substitution of forage for grain acreage only 1) if the program were to be of a short enough time span that a competitive relationship alone between grain and forage be reflected (see discussion of time span) and 2) if the demand for forage (or forage produced products) were of a relatively greater elasticity than demand for grain (or grain produced products). Only then would monopoly profits have been increased or maximized. Faced with the existing low elasticities of demand for rotation products, the monopolists would certainly have rejected the control program in favor of compensatory payments alone as a means of bolstering income.[8]

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[7] This analysis supposes that the monopoly firm has only one indivisible plant. Actually a monopoly firm operating a large number of plants (farms, in agriculture) could not maximize profits by combining grain and forage within the complementary range were it possible to withdraw some plants from production. By withdrawing some plants from production, it would be able to replace their output with a smaller resource input by producing at least to the point of competitiveness in remaining plants. Given this divisibility of producing units, price relationships are also meaningless within the complementary range to the monopoly firm. Our analysis here also assumes that there is a limited amount of production factors for the industry (firm); such is true with land in agriculture.

[8] Unless he were able to withdraw part of his plants from production (see footnote 7).

Farm Recommendations

Agricultural economists, agronomists, and animal husbandmen have provided numerous data and statements which either implicitly or explicitly suggest the equilibrium or most profitable combination of hay and grain crops. To the extent that any of these is put into operation and is in error, an efficient allocation of resource occurs for either the individual farmer or society. Any one of the following common farm recommendations may be in error since none considers both a) the marginal rate of grain/forage substitution, and b) the ratio of grain to forage prices (and also because some ignore the fact that the marginal rate of substitution varies between soils and between rotations on the same soil, or that a complementary range exists): 1) that forage is unprofitable because it sells at a lower price per feed unit than grain, 2) that the value of hay or pasture in farm operations is reflected in market values alone (this is untrue in the complementary range), 3) that the rotation which gives the greatest grain yield per acre should be adopted, 4) that hay should be produced when it yields more feed units per acre than grain, 5) that farm profits will be greater the higher is the index of crop yields. Too, cost of production figures which indicate the net returns per acre of forage as compared to grain are misleading in the sense that they imply a competitive range only.

In terms of an iso-cost curve of the nature under discussion an increased output (acreage) of forage is profitable within the complementary range irrespective of price relationships. Under price relationships of the past, profit equilibrium exists for many soil types at the outset of the competitive stage. However, there are perhaps some important soil types for which the equilibrium falls within the competitive range and some for which the equilibrium calls for hay alone.

Iso-Land Curves and Profit Equilibrium

Basic information is still needed in order to facilitate the most efficient planning and administration of farm resources (either by, 1) individual farmers in maximizing returns or, 2) society in maximizing the net product). The fundamental data needed is of the nature provided by rotation experiments. Each different rotation experiment isolates a different point (A, B, C, D, E, etc. on figure 4) of the relationship. A complete range of rotation experiments

would not provide an iso-cost curve in the sense of our previous discussion. Our iso-cost (factor) curve indicated the various grain-forage output combinations possible from a given total cost (all factors). A series of rotation experiments provides instead an iso-land curve—a curve indicating the various output combinations of grain and hay possible from a fixed, equal or given land input (the fixed land acreage may be either, 1 acre, 80 acres, 500 acres, etc.). The iso-land curve is of the same general nature as the iso-cost curve presented in figure 4, and includes both the complementary and competitive ranges (of the nature and for the reasons pointed out in the iso-cost discussion). As forage acreage and output is increased, grain output will also increase even though fewer acres are devoted to grain. Eventually a point is reached where an increase in forage acreage and output (from a given land area) can occur only if both grain acreage and output is decreased. The equilibrium point (profit maximum for a competitive firm) may or may not be similar for an iso-land curve as for an iso-factor curve. It will be exactly identical were it considered as an iso-cost curve (or if all resources other than land were furnished free to the farmer, or from the standpoint of a landlord who furnishes only the land factor) since the iso-land curve then becomes an iso-cost curve. Equilibrium (maximum profit) can never take place within the complementary range of an iso-land curve if 1) the per acre costs of grain and forage are equal, 2) the per acre cost for forage is less than for grain or 3) the net return per acre of forage is zero or above (income per acre is greater than costs for hay even though acre costs may be greater for hay than for grain). The relationship of forage and grain prices is again irrelevant within the complementary range (of the iso-land curve) as long as forage price is great enough to cover the cost of producing hay.[9] If condition "1" holds, the equilibrium is the same as outlined for an iso-cost curve. If condition "2" holds, a shift of land from grain to forage will lower

[9] If cost per acre is greater than revenue per acre for forage (a net loss), forage (and grain) output will be increased 1) as long as the increase in total grain revenue is greater than the decrease in net forage revenue if the costs per acre for forage and grain are the same, or 2) as long as the increase in net grain revenue is greater than the decrease in net forage revenue if costs per grain acre are either more or less than for forage). The equilibrium then may or may not fall within the complementary range. If either 1) the degree of complementarity of grain with forage is great enough or 2) the net loss per acre of forage is small enough, the equilibrium can not fall short of the point of maximum total grain output although not necessarily maximum grain output per acre (although it could never occur beyond this point if the net return per acre is negative for forage.

costs while increasing output and revenue of both crops. For condition "3" a shift of land from grain to forage will increase net revenue from both hay and grain (even though forage and total costs increase). It is doubtful that there are any cases in which cost considerations will result in an equilibrium within the complementary range of an iso-land curve.[10]

The maximum profit combination (of hay and pasture) for an iso-land curve can fall in the competitive range if, 1) the ratio of forage to grain is great enough. This equilibrium will not, however, occur at a point where gross price and substitution ratios are exactly proportional (inversely) in event the cost per acre for grain and forage differ. Equilibrium must consider cost differentials as well as price ratios and the marginal rate of substitution. It will occur at the point where the ratio of net prices (gross price minus cost per unit) is proportional to the marginal rate of substitution of grain and forage.

The earlier evaluation of farm recommendations again apply to the iso-land curve with the cost exceptions pointed out above. The acre of forage must be identified as complementary or competitive before its contribution to income of the business can be determined. Grain-forage price relationships are unimportant in the complementary range. The price of forage is important here only as it relates to production costs. (See footnote 10.) Price relationships between grain and forage are important alone in the competitive range.

National Welfare

The analysis has thus far been in terms of returns to the business firm. We now turn to some considerations of the social product (to which monetary returns simply represent a means). In terms of resource efficiency, the social product could never be maximized by a grain-forage combination falling in the complementary range of an iso-factor curve. This would be true either if 1) both forage and grain were used in direct human consumption or 2) grain were used and direct consumption and forage were "thrown away" (or contrariwise).

Only a small fraction of the total Cornbelt, corn-oats-forage rotation output is used in direct human consumption. It is mainly the

[10] The forage costs can always be reduced to the land and seed inputs by renting the forage land out as pasture. The forage as pasture then has to sell only for enough to cover seeding and fencing costs to make expansion profitable through the complementary range.

input for the more ultimate consumption good, livestock products. Accordingly, the following analysis deals with the optimum welfare rotation in this case. To facilitate the analysis we first consider an iso-land relationship for crop output and consider only grain and forage as the input for livestock output. (We have left aside for the time being the input of labor and capital—other than grain and forage—in producing crops and livestock. These can be integrated into our analysis by considering forage and forage-related inputs of other factors versus grain and grain-related input of other factors instead of grain alone versus forage alone.) Given this situation, what is the optimum rotation relative to a given output of livestock products desired by society?

The answer is determined by 1) the rate at which grain and forage substitute for each other as product outputs (the iso-factor curve) and 2) the rate at which grain and forage substitute for each other as feed inputs in the producing of a given output and type of livestock product. This can best be illustrated by consideration of one addition production relationship, the iso-product curve. When two or more factors serve as inputs for output of a given kind and quantity of product, several different factor relationships are possible: 1. They do not substitute for each other—must be combined in fixed proportions (the combination of hydrogen and oxygen for water). 2. They substitute for each other at a constant marginal rate (substitution of number 1 for number 2 corn in producing pork). 3. They substitute for each other at a diminishing marginal rate. On the basis of known transformations, the latter is the case which largely holds for grain-forage produced livestock. It is illustrated by figure 6. Grain (vertical axis) and forage (horizontal axis) are considered as two substitutable factors in production of livestock. The curve *GF* is an iso-product curve. It suggests the various combinations of grain and forage that can be employed in producing a given output (or equal outputs) of livestock (e.g. 100, 1000, or 1,000,000 lbs. of milk or pork or beef, etc.). Here grain and forage are competitive (the more of one employed the less of the other required) and 2. substitute for each other at a diminishing rate (increasingly greater quantities of forage are required to substitute for each successive unit of grain replaced and vice versa) as is denoted by the slope (curvature) of *GF*.

In order for the livestock output to be maximized from a given land area, the marginal rate of substitution of forage and grain as

product outputs from the land must be equal to the marginal rate of substitution of forage and grain inputs for livestock products. This equilibrium can best be illustrated by figure 7, where the iso-factor and iso-product curves are considered together. The maximum livestock output can never be forthcoming from a given land area by a rotation representative of any point in the complementary range of the iso-factor curve. A greater livestock production would always be possible if forage and grain output were both increased (or a smaller land input would be necessary for a given livestock product output) through this range. The highest output

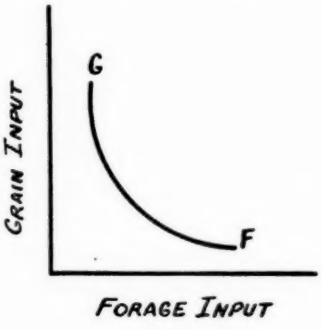

FIG. 6

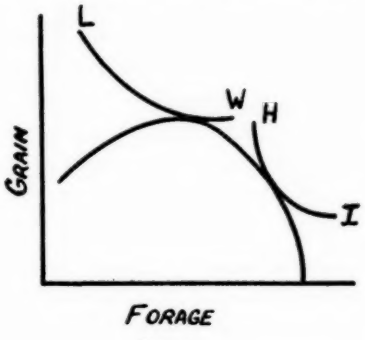

FIG. 7

of livestock product consistent with a given iso-land curve is represented by tangency of the iso-factor and iso-product curves of figure 7. It is at this point that the marginal rate of substitution of grain and forage as product outputs from the land is equal to the marginal rate of substitution of grain and forage as factor inputs for livestock production. If more forage (and less grain) were produced, both 1. successively smaller quantities of forage could be obtained for each grain unit sacrificed as a product output (the iso-factor curve) and 2. successively greater quantities of forage would be required to replace each grain unit used as a feed input (the iso-product curve). A similar "waste" would result if forage output were reduced below this optimum. With a low marginal rate of substitution of forage for grain (either as a product output or feed input) the equilibrium will occur at the point of maximum grain output (as denoted by iso-product curve *LW*). With a high marginal rate of substitution of forage for roughage (either as a product output or feed input) the equilibrium will occur for a rotation

falling in the competitive range of the iso-factor curve (as denoted by *HI*). In any event, the livestock production can never be maximized by a forage acreage and output which falls short of that necessary to give a maximum grain output from given resources.

The above analysis suggests specifically the rotation or grain-forage output combination which would result in a maximization of livestock products from a given land area (or minimum land input for a given livestock output). Basic information is still needed for answering the many problems and controversies centering around extension of forage acreage in the Cornbelt. Sufficient data are not now available from physical researches to indicate the marginal rates of substitution of grain and forage both as 1. product outputs from the land and 2. feed inputs for livestock. When these data are available, consideration of other resources can be integrated to indicate the optimum social rotation.[11]

In the conceptual analysis presented here, the conclusions would be of the very same nature were the two relationships presented in terms of 1) an iso-factor curve including labor and capital as well as land inputs and 2) an iso-product curve with forage and forage-related factors as substitutes for grain and grain-related factors. The optimum social rotation is then again indicated by equation of these two marginal rates of substitution. It can never occur within a range denoting complementarity on a complete iso-factor curve (one including labor and capital resources as well as land).

A perfect pricing and agricultural system would result in exactly this equilibrium (for that portion of resources required to produce the livestock products "desired" by consumers). Three major obstacles stand in the way of this optimum: 1. Lack of knowledge by operators results in rotations short of the optimum. (The recommendations are confusing and conflicting even within and between groups of agricultural economists and physical scientists who suggest equilibriums to farmers.) 2. The short-time span which must be considered on many rented farms gives rise only to a competitive relationship between grain and forage and results in an equilibrium short of that which maximizes grain output. 3. The telescoped economic horizon which grows out of capital limitations, farm fore-

[11] For some preliminary results of a cooperative project designed by economists and technologists to isolate these relationships see M. L. Peterson, C. C. Culbertson and Earl O. Heady, *Iowa Farm Science Reporter*, June 1948, "Good Pasture—Good Beef."

closures, and economic fluctuations similarly gives rise to pure competitive-type iso-factor relationships.

Production Goals

Production goals have been set annually since the outset of the war. Seven years have elapsed since this planning was established. Though now ineffective because means of implementation are lacking, it appears that goals will continue to be established for the next several years because of world food shortages. Too, it is not impossible that future world political events might take a turn to put a strain on food-producing resources. Certainly the period of planning and goal setting is stretching into a period long enough that the full complementary effects of rotations might be reflected on numerous soil types. Now as at the outset of goal planning, each year is taken as independent of others. Goals are put somewhat on a basis as if forage and grain crops relate to each other in a competitive manner alone. This would be the correct basis for goals extending over a short period of one or a few years. Yet because of the longer period over which goals have been and may be stretched, serious thought should be given to setting future production goals at a level which fully consider the complementary relationships between forage and grain in Cornbelt and similar rotations. (This may not be an important factor on all soil types, however.) Production goals have small value since they are not now implemented. However, goals inconsistent with a maximum food output, a current criterion, make even less sense.

Dynamics and Price Expectations

Our main analysis has been in terms of static economics. In another paper we can formulate a complete analysis which encompasses price variations and other dynamic forces. Mention of a few conditioning factors may be helpful here, however. In areas where the natural store of fertility has not been depleted or where rainfall is limited to an extent that a complementary effect is absent, the equilibrium is of the nature suggested by figure 2.

Rotations bring up a somewhat unique situation in forward prices. Under extreme price variations, the firm is likely to look at rotations from the standpoint of a year's time span (figure 2). Accordingly, it may break away from the long-run rotation (which will maximize the social product), to take advantage of a high level

of prices before a market break occurs. A forward pricing scheme could not eliminate social waste of resources here by simply keeping price and cost ratios constant or in line with consumer preferences and techniques. If price and cost ratios were announced and retained in a constant relationship to each other as a reduction in the general level of prices might be necessitated, the farmer (producing to the end of the complementary range in the long-run) would still favor a shift to a cropping plan within the year which would reflect the maximum grain output. Forward prices which specify variations in levels of future prices would still encourage this resource inefficiency which stems from the timing of production.

OBJECTIVES AND METHODS OF GOVERNMENT PRICING OF FARM PRODUCTS

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DURING the last two decades prices of farm products have, to an ever-increasing degree, been the result of government intervention. The trend in this direction has been well-nigh universal and present indications are that it will become even more pronounced in the years immediately ahead. These are simple statements of well-known facts. Another fact which is perhaps not so clearly recognized is that this tendency of governments to participate in the determination of prices is a development of the most fundamental character. It is this basic significance of government pricing[1] and not merely the current interest in and reliance upon it, which justifies special consideration of the concept and its implications by students of agricultural economics.

For all practical purposes governmental determination of prices must be thought of as an alternative to or substitute for the traditional method whereby prices result from the interplay of supply and demand forces in the so-called open market. In the same way the present emphasis on government pricing may be regarded as a fair measure of the degree of dissatisfaction with the traditional method. The criticism of that method, while somewhat varied in character, is perhaps best indicated by a common comment of farmers and farm organization leaders. That comment is to the effect that 'supply and demand' prices are simply not good enough. The inference here, of course, is that some other kind of prices would be so much better that it simply must be secured. There is the further implied assumption that the securing of such better prices is quite possible.

The possibility of choosing from two or more pricing methods suggests the need for deciding the function or functions which prices can or should be expected to perform in our economy. It may well be that a pricing system which is ideally suited for one purpose is entirely unsuited for another. In any case it seems entirely unlikely that any pricing system can be found which would

[1] In this paper the term 'government pricing' will be understood to include any governmental action which is calculated to influence, in whole or in part, the price at which a farm product is sold.

prove equally satisfactory for all purposes.[2] Indeed there would seem to be a very early limit to the number and kinds of things which any pricing system can be expected to do. The present day desertion of the open market system is due primarily to the fact that that system has been held responsible for the failure to achieve certain very desirable results. Conversely it is the hope and belief that these results can be attained through some type of governmental intervention that is mainly responsible for the recent growing support for government pricing. The degree of justification of government pricing programmes would seem to depend on three things. In the first place it will depend on the nature of the pricing objectives. In the second place it will depend on the extent to which the specific means employed to attain the desired objectives can be relied upon to produce results. Finally it must depend on the extent to which pursuance of one set of objectives makes impossible the attainment of others.

From experience to date it would appear that the specific objectives of government pricing programmes may be both numerous and varied. Even a partial listing of the declared objectives will indicate the possibilities. Among the specific aims perhaps the most common has been to secure prices considerably above those that would result from the ordinary operation of competitive market forces. Whether the higher prices are to give farmers a larger share of the national income, purchasing power corresponding to that of some other periods or classes, or compensation for increased costs the central idea has been that prices should be raised in spite of any condition of over supply or lack of demand. During the decade of the thirties price raising was the basic purpose of most government attempts to influence prices. The fact that they were ordinarily referred to as price-raising programmes is clear evidence that such was the case. A second very important and common object has been to provide special price deterrents or inducements and thereby discourage or encourage the use of agricultural resources for particular purposes. There may be a desire to bring about agricultural self-sufficiency as in pre-war Germany. Or it may be part of a plan to conserve foreign exchange as in present-day England. In any case the assumption is that special direction of production is in order and that a government pricing programme can and

[2] See e.g. an article entitled "A Production and Marketing Price Policy" by T. W. Schultz in the April, 1948, issue of *Farm Policy Forum*.

should be used to this end. Closely related to although somewhat different from the foregoing is the provision of a price situation which is designed to bring about a general expansion of production. It is this aim that is mainly responsible for the creation of guaranteed prices which are usually based on production cost estimates.

Quite different is the objective of those who suggest that governments should engage in forward pricing operations. In this case the central aim is to help insure that the production decisions made by the farmers are in line with the true general supply and demand situation. In the absence of forward price guarantees each individual producer is forced to arrive at his own estimate of future price when making his present decision in regard to production. Because the average producer is not in a position to obtain and use all the latest outlook information, his production decisions are certain to be characterized by a large margin of error. It is felt that, if the calculations regarding the future supply, demand and price situation are made by specialized government investigators, the degree of error can be reduced to the point where the government will be justified in guaranteeing future payment of prices not significantly less than the actual market prices likely to prevail. Since the guaranteed future prices would remove all but a minor part of the producer's price uncertainty, the mistakes in production resulting from this uncertainty would tend to disappear. To the extent that this happened those fluctuations in supply and therefore in price and income which occur because of producer miscalculations would be minimized. The general result should be somewhat greater stability from year to year and greater uniformity of income as between producers. Guaranteed forward pricing does not interfere with the ordinary operation of market forces and therefore does not, on the average, result in prices above the competitive level. On the other hand it should help to insure that a larger number of producers secure the full benefit of whatever market price may happen to exist.

There can be little doubt that many people regard the obtaining of more stable farm prices and incomes as a very important and possibly even the most important objective of government pricing activities. For the most part it is stabilization of income from year to year that is wanted. This is not surprising in view of the tremendous fluctuations that have occurred. One has only to contrast the situation which prevailed during the most of the 1930's with

that which preceded it or that which has developed more recently to appreciate the possible degree of instability together with the desirability of getting it reduced. The fluctuations in price from day to day and season to season are much less serious, the former because they more or less tend to cancel out and the latter because they can be anticipated and therefore adjusted to. What farmers really need and want is elimination of the pronounced price and income variations that occur despite little or no change in their production. When it is suggested that the government or governments should evolve a pricing system in order to remove instability, the implication is that, by this means, farmers can and should be insulated against those ups and downs in prices which characterise the general business cycle. In actual fact most of the interest seems to centre in avoiding the price declines rather than the increases. To that extent one might conclude that it is not so much price stability as price adequacy that is the real concern. In any case the significant thing is the suggestion that, somehow or other, government action should be invoked to provide reasonably stabilized incomes no matter how great the changes in supply and demand may be. It is not always clear whether the advocates of such action are thinking of it as a means of actually preventing a general depression or merely as something which may be used to counteract its price-depressing effects.

Closely related to the last mentioned objective is the idea of using a special government pricing system to improve the nutritional standards of low income consumers wherever they may be and consumers generally in undeveloped areas. Sometimes this is spoken of as a way of basing consumption on need rather than on profit. What it amounts to is a plan whereby the consumption of and income from farm products would be expanded by requiring the financially more able section of the community to subsidize and thereby permit consumption on the part of the less well to do. Subsidization would take place whether part of the price actually received by producers for the extra products consumed was paid out of the public treasury or whether producers agreed to accept a lower price for that part of their products which went to the low income consumers. In either case consumption would be stepped up while the possible existence of price-depressing surpluses would be lessened if not entirely eliminated. It is generally recognized that the world's need or desire for food is virtually

unlimited. It is also realized that if anything like full use were made of the most efficient production methods which already exist, the volume of production would be greatly expanded. Before very serious efforts at production expansion can be expected, producers must be assured of the ability to dispose of the extra product at reasonably remunerative prices. This all means that, in order to step up both production and consumption, some method must be found whereby the virtually unlimited need for food can be translated into a truly effective demand. It is to achieve this end that a special type of government pricing programme is being advocated.

Quite apart, however, from any desire to expand either production or consumption, there is a very general feeling that even with supply and demand conditions as they now are, exporting and importing operations must continue for some time at least to be carried on under government auspices and on a contract basis. To the extent that government trading is to continue, it would seem that arrangements for the governmental determination of prices will be absolutely essential. In other words, government pricing will have to be an integral part of government trading. Under these circumstances it might be said that since competitive buying and selling in the ordinary sense no longer exists, prices will simply have to be the result of government action. One might well ask, for example, how else prices could have been determined when Canadian farm products were sold to the United Kingdom and other European countries in recent years.

Somewhat similar is the claim that governments must step in to arrange prices whenever producer and consumer groups find it impossible to reach mutually satisfactory price terms. The most familiar example of such a situation is found in connection with the disposal of whole milk although other illustrations are provided wherever group selling on a contract basis takes place as is the case with various products in this province. In all such cases it is argued that government price action, either actual or potential, is necessary since satisfactory determination of prices is a matter of public interest and importance. Whether the government agency stands by as an official referee during private price negotiations or undertakes to arbitrate a price in the event that these negotiations break down, the general purpose is to see that price equity is established and that the general welfare is safeguarded.

There is still another objective which is to some extent implied

in some of those already mentioned but which is sufficiently distinct to warrant separate mention. This is the idea that a government pricing system, if properly designed, can do much to bring about a world-wide expansion of production and trade. While there is general agreement about the desirability of an expanded economy, there is considerable difference of opinion as to the prerequisites of securing it. It is fairly obvious, however, that there is need for a more speedy shifting of production to areas where the greatest possible efficiency can be secured. Whether this shifting can be most effectively induced by removing all possible impediments to the natural flow of trade and the free play of price-making forces or by establishing a special type of trading and price arrangements is something about which opinions may differ. Those who favour the latter method claim that the general expanding benefits of a free-trading and pricing system depend on the prior existence of circumstances which unfortunately do not exist to-day and cannot possibly exist for several years at least. It is suggested that before that system can be expected to function satisfactorily there must be a reasonable balance between internal needs and external purchasing power. Since this situation is exactly the opposite of that presently prevailing in the great majority of countries, it is argued that these countries simply must continue to exercise control over the kinds and amounts of goods imported and exported. Failure to do so would mean inability to secure the scarce commodities which are essential for reconstruction. Moreover, if free trading was permitted, the inflationary conditions prevailing would result in importation of those goods which would yield the highest profit rather than the goods which were most urgently needed. Indeed it is suggested that "if an essentially free trade policy had been pursued by the countries of Europe in the paralyzed state that many found themselves in during the closing days of the war, it seems highly probable that a complete breakdown rather than a recovery of trade would have resulted."[3] The implication is that the statement would apply equally to the present and future period of reconstruction.

Those who urge state trading on the grounds of current necessity insist that it is entirely consistent with the multilateral trading

[3] See article entitled "Trends in International Trade Policy" by Willard W. Cochrane and Erik Mortensen in the January, 1948 issue of *Economic Review of Food & Agriculture.*

principle. The mere fact that the trading deals are arranged between governments rather than private firms or individuals is held to have no fundamental significance. And while it is admitted that past government agreements have tended to restrict production and raise prices, it is suggested that such results are not inherent in the agreement concept. On the contrary it is held that, if the proper procedures are followed, these agreements will definitely result in production and trade expansion and in prices that are as satisfactory to consumers as to producers.

In the interest of at least reasonable completeness this list of objectives should include some reference to the role of government pricing in the prevention of inflationary price increases. In view of the emphasis placed on this objective since the start of the recent war it seems unnecessary to do more than mention it here. Canadians generally are thoroughly familiar with the meaning and dangers of inflation and the nature of the anti-inflation drive that has been undertaken by the national government through its agency, the Wartime Prices and Trade Board. There is well-nigh universal agreement that the Board achieved remarkable success in the performance of a most necessary task.

Government Pricing Methods or Procedures

The wide variation in the nature of pricing objectives makes it fairly obvious that no one type of programme can be equally satisfactory for all purposes. Indeed it would seem that, to a considerable extent, the method or kind of programme used must depend not only on the objective or objectives desired but also on the particular set of circumstances which happen to exist at the time and place. What might be suitable for general depression periods would probably be quite unsuited to a wartime emergency situation. Or again a compensatory payments plan which would be entirely applicable to United States conditions might not be at all feasible in Canada due to the fact that this country's farm exports make up a much larger percentage of total production. In the same way a programme that might be very desirable when all countries are about equally well supplied with goods and foreign exchange might be positively dangerous under conditions of the opposite sort. This all suggests the need for choosing between several possible objectives plus care in selecting pricing programmes that seem calculated to achieve the chosen ends. A brief consideration of some of the

more important methods applied or advocated thus far will show clearly that such is the case.

When primarily concerned with getting increased farm income, governments have used a great variety of plans. Funds collected through processing taxes have been paid to farmers in return for promises to refrain from producing. Marketing schemes have endeavoured to limit the supplies entering market channels. Surplus disposal schemes such as the Stamp and School Lunch Plans have given goods to low income consumers at less than regular market prices. A percentage of commodities already produced has been deliberately destroyed or used for non-food purposes. Protective tariffs, quotas, quantitative restrictions and exchange controls have limited imports. Amounts sold in domestic markets have been restricted by the subsidization of exports. Monetary inflation has been induced to provide additional purchasing power. Efforts have been made to reduce production by direct controls. Public funds have been used to ensure that prices would reach a stipulated level. Direct cash subsidies have been resorted to in emergencies. Generally speaking all such measures are restrictive in character and therefore entirely inconsistent with the recent emphasis on expansionist economy.

To obtain specific use of resources, chief reliance is placed on guaranteed minimum prices which are raised or lowered in accordance with statistical evidence of market requirements. Such price inducements or deterrents may or may not be accompanied by production directives.

To bring about a definite over-all increase in production, prices are not only guaranteed (sometimes for a period of several years) but are raised by the amount thought necessary to induce the desired degree of producer response. The extent to which this method will prove satisfactory will depend on several things. One is the knowledge which the price-setting authorities have of the price-supply relationships of each product. Another is the financial condition prevailing among producers during the period of response. Farmers who are financially impoverished as the result of several years of depression conditions will be more anxious to expand output than those who have recently enjoyed the economic fruits of several good years. Still another conditioning factor is the technological as distinct from the economic possibility of expanding

production. Any expansion programme must assume that the technical capacity for production is not yet fully taxed.

In order that farmers may make correct decisions when planning production, governments undertake to secure the best possible outlook information and disseminate it in every possible way. In addition to this, however, they may engage in forward pricing operations. As already indicated this means that farmers will be guaranteed minimum prices before the start of the production period. While these forward prices would be guaranteed prices, they would also be supply and demand prices. Indeed it is precisely because they would be in line with the actual prices expected to result from the interplay of supply and demand that governments could afford to guarantee them. While primarily intended to make supply coincide more exactly with market requirements, they are incidentally expected to reduce those fluctuations in actual price and income which result from mistaken expectations regarding the future demand and price situation. They may help to eliminate the well-known cycles which have characterized agricultural production in the past. For successful operation of forward pricing plans two requirements must be met. The calculations of future conditions made by the government experts must be more accurate than the guesses of the average producer. In the second place producers must believe that the guaranteed minimum price will be a reasonable index of the market price which will, in fact, prevail. This second condition will, of course, tend to be fulfilled provided the first one is.

It is in connection with the efforts to achieve stabilization, to improve nutrition and to develop an expanding economy that much of the present controversy regarding pricing methods centres. Speaking summarily the plans thus far suggested involve consummation of a contract and sale at a contract price plus development of a mechanism designed to insure that the terms of the contract can actually be fulfilled. Since it is recognized that instability of price and income reflect instability of supply and/or demand, it is necessary to find ways of either reducing these supply and demand variations or devise means to prevent them from exerting their normal influence on price. For the most part it seems to be assumed that little can be done to actually reduce the supply and demand variations themselves. In any case most of the suggestions

have to do with possibilities of offsetting their effects. The most common line of procedure is well illustrated by the recommendations of the F.A.O. Preparatory Commission on World Food Proposals.[4] According to these recommendations it would be possible to achieve the combined objectives of a more stable farm income, higher nutritional levels and a more expanded economy through the operation of a multilateral international commodity agreement somewhat after the pattern of the recently-negotiated World Wheat Agreement. Such an agreement should stabilize price at a level fair to both producers and consumers; should avoid production restriction and stimulate consumption expansion; and should encourage shifts in production to areas where commodities can be most efficiently produced. The first step would be to get agreement on the level of the stabilized price, or more probably the range within which the price would be maintained. Assuming that were done the next requirement would be the building up of Price Stabilization Reserves. Reserves would be accumulated when the price fell to the stipulated minimum or floor and sold if and when price rose to the maximum or ceiling level. These price stabilization reserves would serve to eliminate price fluctuations arising from variations in either supply or demand. The main supply variations would be those resulting from variations in yield while the really significant variations in demand would signify alternations between general prosperity and depression.

While the above technique might serve to stabilize price so long as supply and demand fluctuated within reasonable limits, it would hardly suffice in the event of pronounced increases in supply or pronounced decline in demand. Should either of these developments occur it would be impossible to sell all the products at a price within the stabilized price range. It is therefore suggested that any product which cannot be disposed of at that price level be sold to needy or low-income groups at a price considerably below the regular or stabilized level. This would be a surplus disposal programme similar in principle to the well-known Stamp Plan but applied internationally. According to this arrangement it is only to the extent that surpluses above ordinary market requirements actually appear that any improvement in nutrition can take place.

Inability to sell the entire supply at the regular or stabilized

[4] *Report of the F.A.O. Preparatory Commission on World Food Proposals*, February, 1947, pp. 21–30.

price and the necessity of disposing of part of it at some lower price or prices dictates the use of a quota plan. No exporting country would enter an agreement unless it was assured of a definite share of the higher-priced market and a definite limit to the disadvantage of having to sell in the lower-priced market. In the same way no importing country would sign an agreement until satisfied that it would not have to buy more than a stipulated amount of its total purchases at the higher price. The real weakness of such a quota plan is that it makes it difficult if not impossible to insure that production will expand where costs are low and contract where costs are high. In practice quotas will naturally tend to be based on past performance. Proponents of agreement programmes suggest, however, that this difficulty can be circumvented at least in part by periodic reallotment of quotas in the light of demonstrated ability or inability to supply previous quotas at the stabilized price level.

The foregoing is merely an outline of the basic ideas involved in the commodity agreement approach. There would obviously be many problems connected with administration and financing which cannot be considered here. Important as these may be the first thing to decide is the extent to which an agreement, if it could be successfully operated, would achieve the desired results. Once that decision is made the actual feasibility of the programme may be considered.

The main alternative, if there still is any real alternative, to the method just mentioned would be to take all possible steps to reduce the supply and demand fluctuations while permitting price to be determined according to the natural play of market forces. Instead of assuming major variations in supply and demand to be inevitable, this method would work towards their removal. It would try to eliminate the main problem by attacking it at the source. The concrete attack might be many-sided in nature. For one thing some reduction of those supply variations which result from farmers' mistaken judgments regarding market prospects might result from a more thorough-going spread of outlook information. The adoption by each country of the forward pricing technique might be even more effective in this connection. Variations in crop yields might be reduced by more general application of scientific findings in connection with moisture conservation, varietal zoning, plant genetics and plant disease control. In the same way variations in production

of livestock and livestock products might be reduced by fuller application of scientific knowledge in the fields of animal genetics, animal nutrition, and animal disease control. In respect to demand stability the main requirement is, of course, the prevention of general depressions. In this connection the recently-developed possibilities of earlier detection plus the various counter-cyclical devices of a financial or fiscal nature that have been attempted or suggested give promise that considerable may be done. Another common cause of variations in both supply and demand is the alternation between imposition and removal of the various artificial impediments to international trade. A general and continuous drive toward greater freedom of trade would have a definitely stabilizing effect. A further stabilizing influence would be the adoption of programmes aimed at making it easier for people to get out of agriculture. Such programmes would help to bring about supply reductions in line with falling demand. Relative fixity of supply despite pronounced declines in demand is a very important cause of wide fluctuations in price.

If, after all these things had been done, prices were still found to fluctuate and fall too much, each country could then consider the supplementary payment plan.[5] As usually presented this is regarded as something which may be used as a second line of defence in the event of a general depression. While it cannot be expected to take the full impact, it may definitely soften the blow. And while not looked on as a cure for depressions, its prompt application might have considerable counter-cyclical effect. The price-raising and stabilizing benefits would naturally vary with the amount of funds available for making payments. This, in turn, would depend on how large a part of each nation's income was of the non-agricultural sort. In countries like the United States, for example, where farm income, though large, is a relatively small fraction of the total national income, much larger supplementary payments could be made than in a country like Canada where agricultural income forms a relatively large percentage of the national income even in the worst of depression years. The size of the revolving fund ($200,000,000) provided for in connection with the Agricultural

[5] For a full explanation of this see Chap. X of *Agriculture in an Unstable Economy* by T. W. Schultz, University of Chicago Press, 1945.

Prices Support Act, 1944,[6] may afford some idea of Canada's present capacity to provide supplementary payments.

Possible Bases for Determining Actual Level of Government Prices

Any serious discussion of the general subject of government pricing must include some consideration of the bases on which the prices are actually determined. Whether it be in peace or war, in prosperity or depression; whether it be negotiated, arbitrated, dictated or calculated, the fact remains that an actual price level must somehow be arrived at. The question is what criteria are to be used when determining the price? Within the limits of this paper one can do little more than mention some of the commonest answers to this question. One such answer is that the price should be made equal to the full cost of production. This is the method followed in recent years by New Zealand when establishing minimum guaranteed prices.[7] The trouble with this is that it is extremely difficult and expensive to make accurate and continuously up-to-date cost calculations and virtually impossible to select a summary figure that will be satisfactory in view of the wide variation of costs as between producers. There is the further fundamental weakness that it is an attempt to determine price from the supply side only. Another suggestion is that the price selected should be one which will give farmers a specified degree of purchasing power. It may be the purchasing power presently existing or that which existed at some time in the past. This is the familiar parity idea, the strong and weak points of which are already well known. A somewhat different plan is to start with prices as they now are and then increase or decrease them by an amount that may be expected to bring about a desired change in income or production. This was the general policy adopted by the Canadian government in its Wartime price-fixing efforts. In pre-war Germany the existing market price was at first only slightly changed to achieve certain political ends. Before long, however, the mechanism of the market ceased to exert much influence and the price-fixing authority took its place. Instead of allowing supply and demand to determine price, the price was

[6] 8 Geo. VI, c. 29, An Act for the Support of the Prices of Agricultural Products during the transition from War to Peace. Assented to Aug. 15, 1944.

[7] New Zealand Dairy Board, *Twenty-first Annual Report for period end. July, 1945*, p. 10.

first established and then a series of prohibitions and orders were used to ensure that the established price was the right price. Instead of being a determined factor price became a determining one.[8]

Still another plan, which is somewhat similar to the first one mentioned above, involves changing the existing price in accordance with changes that have occurred in the prices of major cost items. Price would be reestablished periodically with the aid of a relatively simple formula. This, however, is not a method that can be used for the initial establishment of a price. It is rather a way of maintaining a constant relationship between prices and costs. As such it is subject to the limitation of any plan which fails to reflect the fact that changes in price may be due to changes in demand as well as changes in supply.

A method which attempts to avoid this limitation is that recently recommended by a special committee appointed to "study the problem of how best to establish Class I milk prices in the Boston Market in 1948 and succeeding years."[9] The method calls for consideration of changes in the milk supply, changes in the demand for milk and changes in the general wholesale price level, as well as changes in costs of production. It recommends use of a formula which would relate the milk price to the general price level, the grain-labor index for New England, and department store sales in New England.

Finally, a word may be said regarding the F.A.O. Preparatory Commission's suggestion that prices should be stabilized at levels fair to producers and consumers alike. Just how this is to be done is not made clear although it is suggested that the governments should aim "At a price which as far as possible is fair to the conditions of living of both producers and consumers."[10] This suggests a price based on producer and consumer income levels. It seems more probable, however, that, in practice, the price would be conditioned by the relative bargaining powers of the various parties concerned. In that case several widely different factors might enter the picture. The degree of urgency for finding a market would be an important factor. The amount of foreign exchange available to purchasers would be another. The relative bargaining skill of the negotiators

[8] "Germany's Defence Economy and the Decay of Capitalism," by Frieda Wunderlich. *Quarterly Journal of Economics*, Vol. 52, 1937–38, p. 410.

[9] "A Recommended Basis of Pricing Class I Milk in the Boston Market." A Report by the Boston Milkshed Price Committee.

[10] The Report of the Commission, p. 24.

would play a part. Political influences such as the general attitude of the governments towards self-sufficiency or international interdependence, importance of and protection for the farm population, the need for preventing inflation, or the need for avoiding consumer unrest would enter in. The net result would be called the negotiated price. In connection with this matter it might also be suggested that a price that would be considered fair or satisfactory in 1948 would not have been so regarded in 1933. The prices named in the recent wheat agreement would have seemed very unfair to consuming countries in the 1930's. In the same way even the lowest prices suggested during negotiation of that agreement would have appeared more than eminently fair to producers in the earlier period.

In the United Kingdom the government has recently undertaken to give farmers guaranteed prices in return for production efficiency.[11] This may be regarded as a bargain between the two parties and, in a sense, the prices guaranteed may be thought of as fair to producers and consumers alike. In this case, however, there is an implied assumption on the part of consumers, as represented by their government, that fair prices in the future will mean lower prices. In other words unless prices fall as time goes on, irrespective of cost, they will be regarded by consumers as too high and therefore unfair. But unless prices continue high enough to cover estimated costs producers are likely to consider them unfairly low.

[11] The Agriculture Act of 1947.

APPRAISAL OF THE ECONOMIC CLASSIFICATION OF FARMS

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CONSIDERABLE progress has been made in the development of a new economic classification of farms since the article by Benedict, Elliott, Tolley, and Taeuber appeared in this JOURNAL in November 1944.[1] Farms in the Master Sample of the 1945 U. S. Census of Agriculture have been classified and information as to these groupings has been recently published by the Bureau of the Census.[2] Finally, tentative criteria and suggested groups have been developed for an improved classification to be used for the 1950 Census. An appraisal of the work at this time seems appropriate.

The object of this article is to:

1. Review briefly the purpose of the economic classification of farms.
2. Evaluate its usefulness in providing:
   a. A more adequate description of American agriculture.
   b. A framework for research and statistical work.
3. Discuss some of the limitations of the 1945 classification and the tentative suggestions for modification in 1950.

Purpose of Farm Classification

Differences in size of farm operations and related vocational interests of the different groups of farms in the agriculture of today makes imperative some subdivision of farms into different classes in order to make farm statistics more meaningful and useful. The average farm represents a blend of unlike groups, as farms vary from small residential units to extremely large-scale farming units.

The economic classification of farms is designed for the purpose of "segregating groups of farms that are somewhat alike in their characteristics and have similar problems."[3] Existing classifications are inadequate, particularly "in showing the scale of operations and relative significance of the different producing groups in the total

[1] M. R. Benedict, F. F. Elliott, H. R. Tolley, C. Taeuber, "Need for a New Classification of Farms," this JOURNAL November 1944.
[2] Special Report 1945 *Sample Census of Agriculture*, U. S. Bureau of the Census.
[3] Op. cit., this JOURNAL, p. 698.

picture."[4] Changes in American agriculture during recent years have greatly increased the need for a classification of farms that would remove some of the limitations of existing classifications. Growing industrialization, improvements in transportation, and rural electrification have increased the numbers of part-time and residential units; while mechanization and a wide variety of technological improvements have increased the range in the scale of commercial farming units.

In considering the objectives of the economic classification of farms, one needs to bear in mind that the census of agriculture is the basic source of over-all statistics on agriculture and that the census has included as farms all units of 3 acres or more that were used for agricultural purposes, and even smaller acreage units if the gross value of production was $250 or more. About three-fourths of the census farms account for all but a small percentage of the total value of farm products. Consequently the census counts as "farms" a large number of units that would not be so considered by local people in the areas in which they are found. Some of these are part-time units; others are rural homes with only incidental farm production. For many purposes these units need to be considered separately.

In this setting what are some of the broader groups of farms that need to be segregated to enable a better description of the agriculture of the United States and to serve as a framework for economic research and statistical work?

A useful primary grouping of the new classification of farms is one that groups together into "farming units" all the farms that furnish the major share of the income for the farm family and at the same time provide a place to live.[5] This broad group of farming units would include all sizes of farms from very small to very large. Based on data available from the 1945 census classification such a broad group might include a little less than three-fourths of the total number of census farms but it would account for over 95 percent of the total value of products.

In contrast to the "farming units," the "part-time and residential units" do not furnish the major share of the income to the farm family although some farm production is carried on. These farms

[4] Op. cit., Benedict, Tolley, etc., Nov. 1944, p. 695.

[5] In this connection, see S. E. Johnson "Number and Size of American Farms"—Discussion paper presented at the annual meeting of the American Country Life Association, July 1948.

represent primarily a place to live. Farm people usually do not consider these units as farms and most of the discussion about farm problems implicitly excludes this group, although over-all statistics on income per farm and other characteristics of American farms have generally included all the farms counted by the census.

For most purposes this simple classification into (a) "farming units" and (b) "part-time and residential units" is much too broad. Further break-downs are needed in each group. For the part-time and residential groups possible classifications of significance might include degree of urbanization or major occupations.

As a first step in the segregation of significant groups of *farming units*, the farms in this broad group can be classified primarily on the basis of economic scale of operation. Size of farm is broadly related to differences in organizational structure, capital requirements, and production responses and opportunities. The relationship between size and these characteristics, however, is affected by other considerations and the significance of particular economic size groups will vary with such things as type of farm and production area. For many purposes a generalized distinction between commercial and noncommercial farms is desirable as well as a distinction between the commercial-family farms and the large-scale units.

The 1945 Classification

Appraisal of the economic classification can be sharpened by reference to the results available from the 1945 census classification. Despite some limitations, the results make clear what unlike units are classified as farms—especially from the standpoint of scale and vocational interests. The 1945 classification represents a first attempt to segregate farms into significant groups, and it can be used to illustrate the usefulness of such a classification in providing a better description of American agriculture.[6] The classification used in 1945 was evolved from discussions of the joint United States Department of Agriculture-Census committee and the early article on farm classification which appeared in this JOURNAL.[7]

Three measures were used in distinguishing the groups—gross

[6] See "Long-Range Agricultural Policy" sections on farm sizes and ownership and "Part-time Farming" BAE report to Committee on Agriculture, March 1948 for application of the economic classification as a basis for an analysis of longer run trends and prospects for American agriculture.

[7] Op. cit., "Need for a New Classification of Farms," this JOURNAL, November 1944.

TABLE 1. INFORMATION USED AS A BASIS FOR CLASSIFYING AND SETTING THE SIZE LIMITS OF FARMS BY ECONOMIC CLASS IN THE 1945 CENSUS OF AGRICULTURE

Economic class	Value of products	Value of land and buildings	Operator's labor off farm
	Dollars	*Dollars*	*Days*
I. Large-scale farms	a. 20,000 and over	15,000 and over	—
	b. 8,000–19,999	70,000 and over	—
II. Large commercial-family farms	a. 8,000–19,999	Under 70,000	—
	b. 3,000– 7,999	30,000–69,999	—
	c. 20,000 and over	5,000–14,999	—
III. Medium commercial-family farms	a. 3,000– 7,999	Under 30,000	—
	b. 1,200– 2,999	20,000–29,999	—
	c. 20,000 and over	Under 5,000	—
IV. Small commercial-family farms	a. 1,200– 2,999	Under 20,000	—
	b. 500– 1,199	8,000–19,999	—
V. Small-scale farms	500– 1,199	Under 8,000	Under 100
VI. Part-time units	250– 1,199	Under 8,000	100 and over
VII. Nominal units[1]	a. Under 500	Under 8,000	Under 100
	b. Under 250	Under 8,000	100 and over
	c. Under 500	8,000–19,999	—
	d. Under 1,200	20,000–69,999	—
	e. 1,200– 2,999	30,000–69,999	—
	f. Under 8,000	70,000 and over	—

[1] Categories a, b, and c account for about 96 percent of the farms classified as nominal.

value of products, value of land and buildings, and days worked off the farm. The latter was used to separate the part-time units (table 1). Gross value of product represents the most complete measure of size available from the Census. But it was hoped that by including the value of land and buildings as an additional measure, adjustments might be made for farms on which incomes might be unduly high or low because of unusual circumstances.

Description of Agriculture Provided by the Classification

Seven groups of farms were segregated in the classification of farms in the Master Sample segments used in the 1945 Census.[8]

[8] In the sampling plan a cross-section of small areas throughout the country was selected in such a way that the farms in the sample areas might represent all farms in the U. S. as well as all farms in each State for the items to be included in the

In order to describe the *broad distinguishing characteristics* of the bulk of the farms, segregated in each of the economic classes, they have been designated as: Large-scale farms; large, medium, and small commercial-family farms; small-scale farms; part-time units; and nominal units.

Broadly speaking, the *farming units* of the Nation, where farming is the principal occupation and vocational interest for the farm family, may be visualized as including all classes except the part-time and nominal units. Approximately 4.3 million farms are included in these groups and they cover a wide range in scale of operations.

TABLE 2. PERCENTAGE OF FARMS, FARM ACREAGE, AND GROSS VALUE OF FARM PRODUCTS BY ECONOMIC CLASS, 1945[1]

Economic class	Number of farms	Farm population	Farm acreage	Gross value of farm production	Value of all farm products sold
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
Large-scale farms	1.7	3.7	25.8	21.9	24.1
Large commercial-family farms	7.0	8.5	18.3	23.6	25.2
Medium commercial-family farms	20.0	21.3	24.1	30.0	30.5
Small commercial-family farms	28.4	28.5	18.1	17.1	15.4
Small-scale farms	15.8	14.0	5.8	4.2	3.0
Part-time units	10.3	10.9	2.2	1.9	0.9
Nominal units	16.9	13.1	5.6	1.4	0.7
Total	100.0	100.0	100.0	100.0	100.0

[1] Special Report 1945 Sample Census of Agriculture, U. S. Bureau of the Census.

As already mentioned, the four largest groups in terms of scale of operations (large-scale farms and the large, medium, and small commercial-family farms) account for the great bulk of commercial agricultural production. Over 95 percent of the farm products sold were on these farms (table 2). These groups may be characterized as commercial farms.

Most of the farming units in all of the farm size groups except the largest can be characterized as family farms in the broad sense that Scoville has defined the term.[9] The role of the operator as an em-

enumeration. A sample of one out of every 18 of these sample areas was drawn. In addition, the plan provided for full coverage of large farms regardless of their location. For full description, see *Special Report 1945 Census of Agriculture*, Department of Commerce, Bureau of the Census, page 6 and pages 15–16.

[9] Scoville, this JOURNAL, May 1947, Pages 5–18, Vol. XXIX, No. 2.

ployer of labor appears to be minor relative to his other functions on the large majority of these farms (table 3). It may be assumed also that on most of these farms the operator participates regularly in the farm work and makes most of the management decisions. But this general characterization should not be taken to mean either that *all* family farms are included in these classes and *all* farms larger than family farms are excluded; or that all farms in these classes are "family size" units.

TABLE 3. NUMBER OF FARMS REPORTING SPECIFIED AMOUNTS OF CASH WAGES PAID BY ECONOMIC CLASS OF FARM 1944[1]

Economic class	Farms not reporting	Number of farms reporting cash wages of			Total
		Less than $1,000	$1,000–2,499	$2,500 and over	
	(*1,000's*)	(*1,000's*)	(*1,000's*)	(*1,000's*)	(*1,000's*)
Large-scale farms	5	13	23	60	101
Large commercial-family farms	55	193	107	55	410
Medium commercial-family farms	301	743	112	17	1173
Small commercial-family farms	804	831	24	3	1662
Small-scale farms	645	276	2	[2]	923
Part-time units	429	172	1	[2]	602
Nominal units	784	193	7	3	987

[1] Unpublished data from the 1945 sample Census of Agriculture.
[2] Less than 500.

The large-scale units, as a group, are considerably different from other *farming units* in the structure of their business organization. The scale of operations and the amount of hired labor reported indicates that operators must spend much of their time supervising other workers and on other management problems. About 60 percent of the large-scale farms paid wages amounting to over $2,500 in 1944. In contrast, only 13 percent of the large commercial-family farms paid more than $2,500 in wages for hired labor in 1944. These percentages, of course, should not cover up the fact that differences on many individual farms in these two groups are by no means sharp and clear-cut. *The number of farms paying over $2,500 in wages in 1944 was about the same in both groups.*

Large-scale farms are not numerous. They represented less than 2 percent of the farms and included about 4 percent of the farm population in 1945, but they accounted for over one-fifth of the

total value of production. Large-scale farms are particularly important in the 11 Western States. Most of the large farms in this region are livestock ranches, large-scale wheat farms, or large specialized fruit or vegetable farms.

Commercial-family farms represent the bulk of the farms in the country, both from the standpoint of the number of farms and the amount of production involved. They account for approximately 55 percent of the farms and 70 percent of the value of production.

Commercial-family farms are further divided into groups of three sizes. The large commercial-family farms had, in the main, value of products ranging from $8,000 to $19,999; the medium commercial-family farms from $3,000 to $7,999; and the small commercial-family farms from $1,200 to $2,999. The medium and large commercial-family farms are now more numerous than the small commercial-family farms in the northern and western parts of the country where technological developments have been most rapid. Small commercial-family farms are numerous in the South where mechanized methods are less widely used and where cotton and tobacco—largely hand-labor crops—are important. The reporting of each cropper unit as a separate farm by the Census is also important in explaining the relatively large numbers of small commercial-family farms and small-scale farms in the South. Preliminary estimates for 5 states for which multiple units were tabulated and where they are most widespread indicate that the number of small commercial-family farms and small-scale farms might have been reduced 25 to 35 percent had the count been based on the number of management units in these states.[10]

On a substantial number of small, largely noncommercial farming units the farm is apparently the main source of income for the operator. Farms having a value of products from $500 to $1,200, and where the operator does not work more than 100 days off the farm, have been designated as small-scale farming units. Perhaps a majority of these farmers primarily depend upon agriculture for their living, but more information is needed as to incomes of other members of the family and other sources of income before this assumption can be verified.

Both small commercial-family farms and small-scale farms are characterized by low acreages of cropland, little machinery, small

[10] States included were Mississippi, Alabama, Georgia, South Carolina, and Louisiana.

investments, and consequently by low output per worker. The average value of machinery per farm, for example, ranged from $204 on small-scale farms and $595 on small commercial-family farms to $3,021 on large commercial-family farms. Average crop acreage per farm varied from 22 acres on small-scale farming units and 46 acres on small commercial-family farms, respectively, to 193 acres on the large family farms.

A significantly larger proportion of the people living on small-scale farms and even on small commercial-family farms as compared with all farms lack the modern facilities which help to make farm life more enjoyable. For example, only about one family in 7 on small-scale farms has running water (table 4). Only 2 families out of 9 on small commercial-family farms have running water. Apparently farms need to be larger than even the small commercial-family farms if they are to provide sufficient earnings for farm families to obtain these conveniences.

TABLE 4. PROPORTION OF FARMS REPORTING SPECIFIED FACILITIES, 1945[1]

Economic class	Tractors	Electricity	Telephone	Running water	Kitchen sink and drain	Mech. refrigeration	Power-driven washing machines
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Large-scale farms	86.1	80.4	71.9	76.3	84.3	78.3	79.7
Large commercial-family farms	85.6	75.5	67.0	59.9	74.8	64.3	81.4
Medium commercial-family farms	69.3	61.5	50.1	37.9	58.7	41.9	70.8
Small commercial-family farms	30.3	40.6	26.5	22.3	34.4	24.4	39.6
Small-scale farms	9.3	27.7	14.5	13.3	19.8	14.2	19.6
Part-time units	14.1	37.6	25.9	34.5	45.1	38.2	48.2
Nominal units	9.4	40.6	21.1	24.3	33.2	26.0	30.4
Total	34.4	47.6	32.0	29.0	41.6	31.7	45.8

[1] Special Report, 1945 Sample Census of Agriculture, U. S. Bureau of the Census. Data for kitchen sink with drain, mechanical refrigerator and power driven washing machine relate only to farms with a resident farm operator.

About one and one-half million units fall in the part-time and nominal groups. These groups may be regarded as a somewhat imperfect segregation of units enumerated by the Census on which farming operations are of secondary interest. Their low value of farm products and substantial amount of off-farm work implies that for most of these operators the farm is largely a place to live and only incidentally a supplemental source of income. These units contributed less than 2 percent of the value of products sold and less than 4 percent of the total agricultural production as reported in the 1945 Census of Agriculture, yet they accounted for over one-fourth of the "farms" enumerated by the Census.

The group designated as part-time units represents roughly the units with a size of business that is small in comparison with that of commercial-family farms and on which the operators have a significant income from off-farm work and some farm production. These part-time units had a gross value of all farm products of from $250 to $1,199 in 1944 and reported 100 days or more of operators' work off the farm. Units larger than this on which the operator worked off the farm 100 days or more are included with commercial farms. This segregation assumes that part-time farms larger than those segregated in general would be dependent on farming for income and that they would behave much as other commercial farms. Units with a value of farm products less than $250 were included with nominal units regardless of the amount of off-farm work.

Nearly one million farms were classified as nominal units. For the most part, these units represent residential homes and retirement units. In general, this group contains units reporting less than $500 gross value of products where the operator did not work 100 days off the farm and units reporting less than $250 where the operator worked more than 100 days off the farm. Approximately two-thirds of these units reported less than 10 acres of harvested cropland. A few country estates and other units, which for any reason had a low value of products reported, are also included in this group. Included also was a small number of units shifted into the nominal group on the basis of unusual values of land and buildings.

Uses of Economic Classification of Farms

In addition to its uses in more adequately describing American agriculture, the economic classification of farms has been generally suggested as a means of providing a common framework for research and statistics.

Certainly an improved basis for comparison of data from area to area within a State and from region to region in the United States at a specific time would seem to be opened up by this classification of farms. The economic classification permits a better grouping of farms into size groups, at least for comparison among areas, than has been hitherto available. The acreage of all land in the farm is the traditional measure, but it is defective in several respects. For example, a 160-acre farm in north-central Iowa represents a vastly different situation from a 160-acre farm in western Kansas. Further, as has been pointed out—"a true over-all measure of size calls for

using all inputs and reducing them to an annual cost basis."[11] But land is only one of the productive factors that go to make up the size of farming operation and its importance in the total varies from farm to farm and from area to area. Gross value of products measures output rather than inputs, but it has the advantage of indicating the combined productivity of land, buildings, labor, livestock, and equipment. Thus it minimizes the discrepancies that exist in comparing acre sizes of farms of different types or in different areas. Aside from unusual yield situations for particular areas or farms its major disadvantage is that it represents the gross products of the farm rather than the value of product added. It thus makes cattle feeding, dairy, and poultry farms that buy considerable livestock or feed appear larger than similar farms that grow their own livestock or feed. It also reflects the level of efficiency in the use of the productive resources, but this perhaps is desirable in dealing with national, regional, and area comparisons especially since qualitative variations in inputs, such as management and labor, can be approximated only by variations in the product.

A vertical stratification of farms by size and vocational interest can be useful generally in agricultural research in providing a descriptive orientation, information for the study of broad relationships, and as an aid in designing efficient samples. What are the more specific uses of such a classification in research and statistical work? Some of its potential uses may perhaps be illustrated by an examination of its possible application to some specific research work and to problems in agricultural economics. In this examination it will be assumed that certain changes have been made and that data on farms by economic classes are available for local areas.

Its Role in the Study of Costs and Returns on Family-Operated Farms

Recently considerable work has been done by the Bureau of Agricultural Economics and various Land Grant Colleges in developing measures of changes that have occurred on commercial family-operated farms by type, size, and location. To be of greatest usefulness it is essential that direct comparisons be made from area to area of farm incomes and other characteristics. This requires a uniform standard for classification and sampling.

In order to study family-operated farms as a group it is necessary

[11] Black, Clawson, Sayre, Wilcox—*Farm Management*, Page 485.

first to separate them from the small-scale farms and rural residences found largely at one end of the size scale and from the large-scale farms at the other end. The economic classification of farms can provide a relatively simple and effective method of doing this.

In some areas small-scale farming is important, and in such areas separate studies of the changes on small-scale farming units are also desirable. In areas like the Mississippi Delta and range areas, large-scale farms are quite important and they also merit separate treatment.

The characteristics of commercial-family farms, even over rather wide areas and without further break-downs, show a considerable

TABLE 5. DISTRIBUTION OF COMMERCIAL FAMILY FARMS AND ALL FARMS BY ACREAGE OF CROPLAND HARVESTED, EAST NORTH CENTRAL DIVISION, 1944

Acres of cropland harvested	Commercial family farms, classes II, III, and IV	Total all farms
	Number	*Number*
0– 9	28,185	201,310
10– 29	55,917	150,546
30– 49	105,459	144,400
50– 99	236,634	254,751
100–199	155,372	159,641
200–499	32,808	41,284
500–999	393	1,745
1,000 & over	2	178

tendency to concentrate about a mean value, with the variations distributed in somewhat normal fashion above and below the center of concentration. The frequency distribution for commercial-family farms and for all farms in the East North Central division illustrates this tendency and the effects of eliminating noncommercial and large-scale units (table 5). When further break-downs of farms are made by type, size, and area the degree of central tendency can be further improved. This greatly increases the value of the estimate.

Periodic field sampling of these farms is required to obtain detailed information as to farm inputs, and farm costs and returns. Procedures used in the recent survey by the Bureau of Agricultural Economics in cooperation with Land Grant Colleges in selected type-of-farming areas illustrates possible uses of the economic classification in this work. Census data on a sample of farms by type,

value of product groups, and associated characteristics were tabulated. Commercial-family farms were then separated for use in the field sample. The sample was designed to obtain adequate numbers in each size group for purposes of analysis and generalization. Efficient field sampling for these purposes required a differential sampling rate for different sizes and types of farms.[12] These sampling rates were worked out from the census sample classified by value of products. Area sampling was used, but the proportion of farms in each group taken was regulated by the proportion needed for an adequate sample of each specific size and type group.

Selection of farms for enumeration in the different size groups was made on the basis of obvious physical resources such as crop acreage, size of farms, livestock numbers, etc. This relationship can be used in providing a vertical stratification to obtain sufficient farms in each group. Use of the economic size classification in the selection of the sample in this way, however, requires the working out of resource criteria that will bridge this gap. It involves two steps: (1) determining the physical resources most closely associated with the variation in the scale of operations, and (2) the usual range in the acreage or quantity of physical resources associated with each scale-of-operations group for each area and type of farm.

Generalization of Implications from Local Farm-management Studies

One of the weaknesses of local farm-management studies has been the lack of a basis for applying such studies to the area involved and in the comparison of results between areas. How far an economic classification of farms available by local areas can go in providing a basis for such generalizations and comparisons is an important question.

The economic classification of farms permits more specialized study of the farming and residential units in the local area. Even a somewhat imperfect segregation of the *farming* and the *part-time* and residential units can greatly facilitate this work. The problems and opportunities for adjustment on farming as distinguished from residential units are distinct enough to warrant separate study and to require different types of information.

The economic classification, together with information as to

[12] In this connection, see article "Models in Farm Production Economic Research" by Earl Heady, This JOURNAL, May 1948, P. 222–224.

type of farming, physical conditions, and other factors, can also be useful in selecting farming units to represent the significant variations in farming conditions in the local area. Care needs to be exercised in selection of the farms for study to get a cross-section view of the problems faced by the various groups of farmers. Suggestions for economic adjustment even for the farming units in a relatively homogeneous area can seldom be of a blanket type. Samples of farms need to be designed to obtain adequate numbers of farms in each of the groups where opportunities appear significantly different. Economic classification can furnish the basis for a differential sampling ratio that will secure adequate numbers in all groups without obtaining excessive numbers of the more common sizes.

To make the economic classification of greatest usefulness in local production studies, further break-downs by type of farm and other criteria are needed. The number of farms in the various size groups, for example, vary significantly with the type of farm. Adjustment opportunities can be expected to vary with physical conditions, type and size of farm, and other factors. Classification of farms by production areas, economic class, and type of farm could be very useful in giving a broad picture of the differences in characteristics. When the type and size of farm appear to affect significantly adjustment opportunities within a local area, such a classification could be highly useful in selecting the sample to insure adequate representation of the significant groups of farms in the field sample.

In order to take account of differences in physical conditions on farms in the area, additional information as to soils, topography, and other factors is needed on each farm. A cooperative study now under way between the Oklahoma Agricultural and Mechanical College and the Bureau of Agricultural Economics indicates one approach to this problem. Census data for a sample of the farms were used as a framework for this study. Commercial farms were segregated for farm-management study, chiefly on the basis of the value of farm products sold and used. Important physical conditions, such as type of soil, erosion and slope, were then determined for each farm in the sample by locating the farms on SCS soil maps available for these counties. Finally, farms were divided into significant groups on the basis of size and type of farm and physical conditions, and individual farms in these groups were selected for detailed analysis. Effects on the farm income, production, and land

use of each of the significant groups of farms will then be used as a basis for analyzing effects on the area as a whole.

In the study of *farming units* of a given type in a given area it may sometimes be desirable to classify the farms on the basis of various combinations of resources rather than to segregate the farming units first into economic class or value-of-product size groups and then to subdivide on the basis of combinations of physical resources. The relative desirability of these two methods will probably vary depending on factors such as (1) relative importance of differences in combinations of physical resources and of size in the adoption of new methods, (2) adequacy of gross income as a measure of size as compared to other measures, such as acreage in the farm, for the area and type of farm studied, (3) complexity of the physical resource—size relations.

Stratification in Sampling

The economic classification of farms may have great ultimate usefulness in serving as a standard for stratification in sampling and for presentation of data on agriculture. A considerable portion of the effort of research workers in agricultural economics is spent in developing descriptive measures of agriculture. For present purposes these measures may be classified into two important groups: (1) Those reporting only aggregates, and (2) those reporting statistics on a per farm basis.

In estimating aggregates the economic classification can be of considerable use in setting an efficient standard for sampling procedures and for preparing data. In statistical studies like crop reporting several commodities are usually covered, and the farm serves as a unit of sampling. One use perhaps lies in comparing the distribution by scale of operations of the crop-reporting lists with the distribution of the universe stratified by scale of operations. Twenty-five percent of the farms enumerated by the Census contribute less than 5 percent of the total value of products, and 2 percent report over 20 percent of the production, and thus an intermediate group of 73 percent of the farms account for about 75 percent of the total value of products. Efficiency of sampling of crop and livestock data could be increased considerably if sampling methods using differential rates of sampling were devised. Crop-reporting farms are generally above average in size, but more information is needed as to the degree to which the variation is in

accord with their relative importance in production. Adequate representation of medium and very large farming units is especially essential to efficient operations.

When estimates as to farm population or facilities are desired, a different method of sampling and intensity of sampling among different groups would increase efficiency. An economic classification of farms, showing number and characteristics of farms by regions would provide a base for designing samples to fit the problems involved.

In measuring such items as income, crop acreage, or expenses per farm, the economic classification becomes important, both in stratifying the sample and in presenting results. The frequency distribution of such items for all farms is usually skewed sharply to the left or it is often of a J shape. Neither averages nor any other measures of moment are adequate to describe distributions of this type. Only when all these farms are broken down into groups that are somewhat homogeneous can the averages of their characteristics be expected to be representative of the group. Only then is it likely that distributions of a descriptive item such as income or expenses will show a degree of normality.

One of the more difficult problems that agricultural economists face is evaluation of trends through time in number of farms and characteristics by significant groups. Accurate measures of changes in number of farms by size groups are especially difficult. The acreage of all land in farms is the traditional measure, but as previously indicated it is defective in several respects. Recently an attempt has been made to measure changes in number of farms by size groups by using the number of farms in each value-of-product group, correcting for changes in price level of agricultural products.[13] A procedure of this kind is complicated but it would appear to offer some advantages over trends based on differences in size measured by acres. To be most useful, corrections for price level should probably be made on an area basis with some correction made for yield deviations from the normal trend in the particular years in which the Census was taken, as well as corrections for trends in purchased inputs such as machinery, fuel, etc.

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[13] J. C. Ellickson, J. M. Brewster, "Technological Advance and the Structure of American Agriculture," This JOURNAL, November 1947.

Studies of Economy of Scale and Resource Allocation

Resources vary widely on the 4.3 million farms tentatively classified as farming units. Although the problem of determining whether these units are efficiently organized is by no means easy, an economic classification provides a basis for such analysis.

Recently economists have emphasized the fact that agriculture, although it operates under conditions of atomistic competition, continues to be inefficient in many sectors. Marginal productivity of the factors are not equal to the marginal price or opportunity cost. Further, all farms do not respond in the same way to economic and technological opportunities. Consequently, net returns are not maximized. Although this condition is not of recent origin nor has it lacked recognition from the time the earliest farm-management studies were made, it is of continuing importance. Attempts to evaluate the degree to which inefficiency of this kind does exist deserve increased emphasis.

As Johnson has indicated, "the first step is to study the way in which resources employed in agriculture are allocated."[14]

The economic classification of farms, especially if stratified by type of farm and area, provides more information on the resources of various significant groups than has been available hitherto. It also permits simplifying to some extent the problem of judging how far the use of such resources departs from the ideal or standard. The standard of efficiency is adapted primarily to *farming units*. Labor, for example, may not even be considered as a cost to the part-time or retired operator. This does not mean that resources allocated to part-time and residential units may be considered to be adequate for all these farms. It means simply that the standards and the analysis used must be more complex—or at least different.

Closely associated with this is a need for detailed analysis of the various groups of farming units by production area and type of farm to determine differences that exist in the financial structure, including the relation of fixed and variable costs and the associated differences in production response to changes in prices and technology.[15]

A related problem of importance in agricultural economics re-

[14] D. Gale Johnson, This JOURNAL, November 1944, Page 630.

[15] Some tentative hypotheses regarding significant differences in the producing units in agriculture have been set up in the article by Brewster and Parsons "Can Prices Allocate Resources," This JOURNAL, November 1946.

search centers around the analysis of the economy of scale of operations and the nature and place of family-sized farms. Farm classification, even in great detail, cannot answer all of these problems. But a classification by type and size of farm could perhaps provide a broad descriptive framework into which more detailed analysis could be fitted. In types of farming well adapted to machinery, the medium and large commercial-family farm may be common and represent pretty well the range in scale of operations which can efficiently use machinery and labor with prevalent management skills. Returns to the operators of such farms may often be above any arbitrary minimum standard of income. But this is not to say that with above-average management or other unusual conditions larger farms are not more efficient. It perhaps roughly marks out the range above which additional increases in efficiency are obtained more slowly or under conditions in which the capacity of one or more of the productive factors is unusually great.

In the noncommercial and poor-land areas, and especially where capital requirements for getting started in farming are low, the typical farming unit may be smaller than would provide minimum adequate income for a farm family, or than that which would make efficient use of modern machinery. Farm sizes in such areas have been directly affected by population pressure and the nature of such an agriculture as a residual calling and a place to live. A classification of "farming units" by size and type of farming should, however, give some indication of the current range in scale of operations achieved by farmers of the area which has provided for income levels that are accepted by local residents. Moreover, it can often provide instructive examples of groups of larger units. Further analysis in such areas is needed to determine the capital requirements and management skill needed for the operation of such family-sized farms and incomes as can be reasonably expected.

Research into this problem cannot rest with the description of areas and groups of farms in which this problem is suspected to exist. Is the problem of inefficient units in agriculture capable of solution? This brings up the problem of alternative opportunities open to these farmers and the criteria needed to analyze this problem. Johnson and Rush in their article on farm-management research on low-income farms have suggested that: "Sub-groupings will usually need to be made on the following factors in order to have groups of farms with similar adjustment opportunities: (1)

quality of land, (2) size of farm (total acres or acres tilled), (3) tenure, (4) indebtedness, (5) age of operator, (6) supply of labor."[16] The opportunities and problems of each significant group will need to be carefully analyzed to determine the nature and extent of the changes that can feasibly be made. From such an analysis programs can perhaps be formulated to guide these changes.

Suggested Modifications for 1950

The classification used in 1945 is deficient in several respects. In view of the purposes to be served, and of some of the limitations of the classifications used in the 1945 census, the following major modifications have been tentatively suggested for 1950:

1. Combining farms in the South into management units preliminary to classification.
2. Using value of products sold (or to be sold) instead of gross value of products as a measure of scale of operations.
3. Improving value of sales as a measure of size.
4. Eliminating the value of land and buildings as a criterion for classification according to size.
5. Developing criteria for more adequately segregating farms where most of the operator and family income is from off-farm sources.
6. Segregating abnormal units into a single residual group.

In arriving at these tentative suggestions several assumptions are implicit. One of the primary uses of such a classification is to provide more homogeneous groups of farms for presentation of farm data and analysis of farm problems. This particular classification is based primarily upon farm units, not upon farm operators. To be most successful for comparative purposes, one system of farm classification must hold for the entire country. However, a sufficient number of classes should be made to permit appropriate re-groupings for special analysis in different areas of the country.

One limitation of the experimental attempt to classify farms into major groups that behave in a similar fashion and that have broadly similar amounts of resources lay in the Census definition of a farm used in the Southern States. Cropper and other sub-tenant units of a plantation are considered as separate farms, whereas the management unit represents the most desirable basis for analysis of

[16] S. E. Johnson, and D. R. Rush. "Farm Management Research." This JOURNAL Feb. 1941, p. 226.

most farm problems. It is assumed that cropper units and other sub-tenant units can be combined into management units in 1950.

In searching for criteria that could be used as a basis for classifying farms enumerated in the United States Census of Agriculture by economic scale of operation, it was necessary to keep in mind (1) the many uses which might be made of farm data classified in some objective manner, (2) the large number of farms to be classified, and (3) the kinds of data available in the Census schedule. Several criteria were tried.

Specific consideration was given, for example, to the possibility of the use of the amount of labor hired as a criterion for differ-

TABLE 6. NUMBER OF FARM OPERATORS BY AGE BY ECONOMIC CLASS OF FARM, 1945[1]

Economic class	Not reported	Under 55 years	55–64 years	65 years and over	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Large-scale farms	1	70	21	9	101
Large commercial-family farms	2	296	78	34	410
Medium commercial-family farms	5	841	223	104	1,173
Small commercial-family farms	13	1,097	337	215	1,662
Small-scale farms	13	492	207	211	923
Part-time units	1	461	106	34	602
Nominal units	25	500	201	261	987

[1] Unpublished data from the 1945 Sample Census of Agriculture.

entiating between large-scale units and family farms. But this differentiation does not seem to furnish a very reliable guide to size. Some of its shortcomings seem to arise because of variations in the amount of contract and custom work, differences in size of farm families, partnerships, degree of mechanization, and various tenure arrangements. It has previously been pointed out that a considerable number of farms classified as large and medium commercial-family farms for one reason or another hired large amounts of labor.

Another measure to which some consideration was given was the use of the age of the operator to attempt to separate the retirement units. While there is a concentration of older operators in the groups classified as nominal and small-scale, the number of operators over 65 on commercial farms raised some doubts regarding the validity of age to reflect the activity of the operator. (Table 6)

Within the limitations imposed, the value of sales appeared to be the best single criterion of scale of operations. It was considered a better measure than the gross value of product primarily because of the widely different valuations on similar amounts of production for home use especially on small farms. On larger farms the relations between the two measures are so close that it makes little difference which measure is used.[17] In preliminary discussions on the 1950 census, efforts to improve the accuracy of the estimates of sales have been discussed, and it is planned to obtain this information in more detail than in the 1945 Census of Agriculture. Such a procedure should further improve the adequacy of the value of sales

SUGGESTED CLASSES AND CRITERIA FOR CLASSIFYING FARMS ACCORDING TO ECONOMIC SCALE OF OPERATION

Class	Criteria	
Residential and abnormal units	*Value of sales (Dollars)*	*Value of land and buildings*
1. Abnormal	Under 1,000	$20,000 and over
	1,000–2,499	40,000 and over
	2,500–4,999	75,000 and over
	All institutions	
	All unclassified units	
	Misc. abnormal units[1]	
		Operator's work off farm[2]
2. Nominal	Under 250	Less than 100 days
3. Part-time	(a) 0–249	100 days and over
	(b) 250–999	100 days and over
Farming units		
4. Small-scale	250– 999	Less than 100 days
5. Small commercial-family	1,000– 2,499	—
6. Medium commercial-family	2,500– 7,999	—
7. Large commercial-family	8,000–19,999	—
8. Large-scale commercial	20,000 and over (after perhaps a deduction for feed, poultry, and livestock bought)	

Note: Consider classes 3(a) and 3(b) as major and minor groups in which a and b in the same class may be combined.

[1] Such as all units having less than $1,000 sales and no farm residences and units with less than $1,000 sales and with more than, say, 100 acres of harvested cropland.

[2] Consideration is also being given to the development of additional criteria to separate more accurately the small units on which farming does not represent the primary source of income for the operator and family.

[17] *U. S. Census of Agriculture* Vol. II Ch. X "Value of Farm Products and Type of Farms" p. 612–647.

as a measure of size. A somewhat different problem arises from the fact that the value of sales represents the gross value of the product of the farm rather than value added. Because of the complex type of the problem it is probably impossible to handle it adequately in a census classification of farms. Some consideration however has been given to making adjustments for such items as feeder cattle and feed in segregating the group of large-scale units.

In addition to total value of products, the 1945 classification was also based on the value of land and buildings as a measure of economic size.[18] Farms with extremely high or low values as compared with the reported value of products were raised or lowered in the size-class scale. Only a little over 2 percent of all census farms were so shifted, but the relative number varied by economic class. For 1950 it appears that the addition of an abnormal class to include country estates and improved reporting of value of sales will be a better method, although if large areas were to be seriously affected by crop failure in 1949, value of sales would not be a fair criterion of the size of farm.

A limitation of the present classification is that many of the classes contain a few abnormal units with investments extremely high in relation to production. The group called "nominal" is to some extent a residual class and perhaps represents the extreme of this situation. In the main this group represents very small units that are primarily rural homes or retirement units. It contains, however, a few large units considered abnormal in 1944 that did not fit into the other classifications.

High value of land and buildings relative to sales, plus some editing to sort out institutions and unclassified units, would appear to distinguish those units tentatively called "abnormal." On this basis the establishment of an abnormal class has been discussed. In the 1945 classification the nature of the farms in the groups characterized as part-time, nominal, and small-scale seems particularly difficult to determine. The development of criteria to separate these farms into more meaningful and clear-cut groups is a problem of considerable importance. Proportion of operator and family income from farm and nonfarm sources (if available in the 1950 Census) possibly could be used in conjunction with off-farm work to separate more adequately part-time from small-scale farms. A final problem is that of securing comparability through time,

[18] See Special Report, *1945 Sample Census of Agriculture.*

especially in the major groups of farming units such as commercial-family farms, large-scale farms, and small-scale farms. Value of sales in terms of dollars fluctuates considerably from Census to Census due to changes in price level and yield conditions. This, of course, can be partially remedied by changes in the class intervals, but further discussion of the problem is needed.

Summary

The groupings made in the 1945 Census represent an important forward step, especially in the clarification of the concept of a farm. The characteristics of the 5.9 million farms in the U. S. Census span a very wide range—especially in respect to scale of operations and the many characteristics that tend to vary with scale. Not only do the major characteristics have a wide range but the distributions are so extremely skewed that averages are misleading.

Both statistical evidence and observation seem to indicate that in recent years the variations in such characteristics have become even greater. Mechanization and the wide variety of technological developments have tended toward fewer and larger farming units, while the increasing importance of rural living and part-time farming operations have increased the number of small largely non-commercial farms. Broad farm averages, which have always been of little significance, now seem even less meaningful.[19]

Analysis of Census data by class of farm suggests the hypothesis that the aggregate number of farms counted by the Census may be viewed as a conglomerate of at least two broad populations which in turn may be broken down into numerous groups for special purposes. A broad distinction may be drawn between the *farming units*, where the primary objective of the operator is obtaining an income from farming and those units that provide in the main a place of residence. In general, the nominal and part-time groups represent farms of this latter type, and the commercial and small-scale farms are of the former type.

Within the broad category of farming units it would appear possible roughly to separate additional groups for special purposes. The four largest groups in terms of scale of operations can all be

[19] Perhaps the large number of part-time and retirement units ordinarily counted as farms helps to explain why net income of farm operators per farm has been lower in recent years in New Hampshire than in Mississippi—see "Net Income of Farm Operators from Farming, by States 1943–44." Separate from Farm Income Situation, July 1946. BAE Mimeograph.

classed as commercial farms. All groups of *farming units*, with the exception of the large-scale units, may be broadly regarded as family farms. The three middle groups of *farming units*, in general, represent the commercial-family farms. Such a distinction is beset with difficulties. Some of these can be removed, at least in part, by improvements in the farm classification. For example, more information on the income received from off-farm sources would enable a better distinction between the part-time units and the small noncommercial farming units. Many limitations will remain, however, and these will need to be borne in mind in using the economic classification of farms.

One important application of the delineation of these broad groups of farms as classified by the Census will be in enabling a better description of American agriculture and a better orientation of farm programs to fit the needs of the various groups of farmers. Equally important is the better basis that is provided for presentation of data and the description and analysis of American agriculture on an area, State, and regional basis. This is especially important in statistics and research of an over-all character for which aggregates have previously been used without any stratification. In much of the analytical and research work one of the goals is the segregation of the farm groups that have different resources and behave differently in response to changes. One question that should be raised, therefore, is the extent to which this classification permits segregation of the various groups that vary in their resources and behavior. From the standpoint of analytical and research studies the classification can perhaps serve only as a starting point. Further breakdowns are needed to achieve a degree of homogeneity within each group sufficient for analytical purposes. For example, for many purposes the economic groups need to be broken down by areas and type of farming before proceeding with analysis of other relationships or adjustment opportunities. Thus the economic classification can achieve its greatest usefulness for research workers only in combination with the other classification criteria that are needed to delineate the significant groups for the particular purposes of the study.

PROVISION FOR NUTRITION IN THE FORMULATION OF AGRICULTURAL PROGRAMS

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THE object of this article is to show how the nutrition needs of the population can be taken account of along with productive capacity in designing agricultural programs. We hear much talk to the effect that we should plan our production from a nutrition point of view. The Bureau of Nutrition and Home Economics even goes so far as to make up an annual balance sheet of calories, proteins, vitamins, etc. As will be pointed out later, the statement on a long-range agricultural policy presented to the last Congress by the Department of Agriculture proclaims expansion of consumption rather than restriction of production as the objective of agricultural programs. But neither this statement, nor any other that I have seen, outlines a procedure for planning food production to meet determined consumption needs.

One could, of course, make a pronouncement to the effect that every man, woman, and child should have food enough of the right sorts to make reasonably possibly a good standard of health and working efficiency. Surely such a declaration would be as well based as the declaration in Senator Murray's full-employment bill of a few years ago—that did not get passed in its original form, of course—that every worker has a right to a job. But it is not necessary to raise any political issues of this type. It is better simply to say that no nation can afford, as a pure matter of economics, to have any appreciable fraction of its people undernourished; that the economic losses and wastes of having some of its people malnourished clearly outweigh the costs of making the needed foods available. But even this statement needs substantiation, as we shall presently observe.

The full burden of the economic wastes and losses of malnourishment are seldom fully realized, it is true. Ordinarily these wastes and losses are thought of in terms simply of time lost from work, and doctor and hospital bills. More important are the low ratios of work output to food input when populations are fed on low or unbalanced rations. The output-input ratios obtaining with food and human populations have several components. The most obvious of

these involves the simple maintenance-plus-production function, in the same form as we apply this to work animals, cows or hens. Stated in terms of hens, for example, and using the simple assumptions of the Morrison feeding standards, a 3½-pound hen needs 52 pounds of grain simply to maintain her body for one year. If she lays 100 eggs, she needs 52 plus 14 or 66 pounds of grain. Finally if she is a hen of very high capacity and able to lay 300 eggs, she needs 52 plus 42 or 94 pounds of grain. Obviously the 94 pounds of grain input returns a much larger egg output per pound of grain than the 66-pound input—over twice as large, in fact.[1] The maintenance ration for an average adult male doing no work is around 1,800 calories. An intake of 2,400 calories, such as allowed for a "sedentary" worker in the Food and Nutrition Board's recently revised Recommended Dietary Allowances therefore means a working ration of 600 calories; the 3,000 calories allowed for an "active" worker means a working ration of 1,200 calories; and the 4,500 calories allowed for a person doing heavy work means a working ration of 2,700 calories. Thus the "heavy" worker does 4½ times as much physical work as the "sedentary" worker, and more than twice as much as the "active" worker.

Unfortunately, very few data are available as to the actual food intakes of workers in different countries. The average intakes per capita reported in the *World Food Survey*[2] combine men, women and children of all ages into one figure. They also include varying amounts of waste in the use of foods, since they are all ostensibly "at the retail level." The absolute range in the average caloric intakes reported is from 1,910 for Mexico to 3,280 for New Zealand, and 3,250 for the United States and Denmark. Probably the range in actual intakes is less than 1,000 calories, and some of this is accounted for by differences in climate and stature. What is left, however, probably means that 500 to 600 more calories per person are left for a working ration in some countries than in others.

But these figures are per capita of the whole population. Before they can be converted to terms of the workers, some other elements

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[1] These data are from *Recommended Nutrient Allowances for Poultry*, a publication of the National Research Council, 1944. The actual input-output ratios are not as simple as these. A hen begins laying before she gets a full maintenance ration, losing weight while so doing, and ordinarily begins converting some feed into gains in weight long before the 300-egg level is reached. The true function is a curve. See Black, Clawson, Sayre and Wilcox in *Farm Management*, Chart 133.

[2] *World Food Survey*, Food and Agriculture Organization of the United Nations, Washington, 5 July 1946.

in the problem must be considered. A major factor is length of life. To cite extreme cases, the 66 years of life expectancy at birth of New Zealand means that much more of the food consumed is used by workers than in a country with an expectancy like India's of 26 years. The Indians who die before they are 10 years old in most cases never produce enough to maintain their bodies. Their mothers provide for their growth from conception through lactation, and after that they must have food and clothing provided for them by the workers. Those who survive until 10 have an expectancy of life of only 36 years. The working life of the average person born in India is therefore only 14 years. In New Zealand, it would be perhaps 50 years except for the fact that many more persons in New Zealand live well beyond their working years. The ratio of workers to total population is therefore much higher in the countries with a high life expectancy than in those with a low life expectancy. Not only is involved the extra food that is required for those who never live long enough to pay back for all the food they consume in their early years, but all the extra energy of the mother that goes into their care, and all the extra housekeeping.

What meaning has such analysis for our own country? The foregoing discussion has been in terms of calories. Very few persons in the United States suffer very long from a lack of calories. No doubt far more Americans consume too many calories than consume too few—even counting in those who consume too few by choice. But there are many persons who consume less than needed for health, normal growth, or working efficiency of essential proteins, or calcium, or some of the vitamins. And no doubt there is a principle that applies in this case that roughly parallels Liebig's Law of the Minimum for plant nutrients and plant growth, which says in effect that the production of an acre of land is limited to what is yielded by the plant nutrient present in least quantity. Whatever that principle is for food, it is probably as valid for food nutrients as it is for plant nutrients. In other words, the effectiveness of any diet in achieving health, growth, and working efficiency is definitely qualified by the essential elements in it that are present in least quantity.

It is therefore probable that even in the United States a considerable economic loss arises from relatively low ratios of work output to units of food input for a sizeable fraction of the population—over and beyond what appears in loss of time on the job and medical costs.

The economic losses from poor diets probably do not increase in rigid proportion as the levels of diets decline, at least as these levels are ordinarily measured. Some pretty efficient diets no doubt have relatively low proportions of meats and some other foods that figure importantly in the high indexes of per-capita food consumption reported for some countries in the *World Food Survey*. To be specific, the efficiency of food use is surely not a half lower in Japan than in Denmark, merely because the index of per-capita food consumption is a half lower, as reported in Table 1 accompanying. But no doubt there is a rough inverse correlation between these two variables, with some kind of a regression coefficient.

TABLE 1. INDEXES OF FOOD CONSUMPTION BY COUNTRIES, 1935–39

Country	Food consumption (1)	Calories (2)	Composition of the diet (3)
United States	100	100	100
New Zealand	113	101	112
Denmark	97	99	98
United Kingdom	88	92	96
Netherlands	85	91	93
Germany	81	90	90
Belgium	71	86	82
Poland	63	83	76
Chile	60	72	83
USSR	59	87	68
Italy	56	76	74
Greece	54	75	72
Japan	48	70	68
Mexico	48	59	73
Puerto Rico	47	68	69
Philippines	44	62	71
China	34	68	51
India	33	62	53

It is necessary to explain that these index numbers are figured by using the same unit-value weights as are now employed by the Bureau of Agricultural Economics in figuring the annual index numbers of per-capita food consumption in the United States. The 100 base for these is United States consumption in 1935–39. These index numbers must therefore be understood as indicating what it would have cost, relatively, to have bought the diets of these countries in the United States in 1935–39.

Given a certain ratio of work output to food input in a country, the next question is: Is the country in position to improve this ratio? and the next is how to go about doing it. Answering these questions requires weighing against the losses described—at the margin, of course—the *additional* costs of producing and distributing the additional foods needed. In the United States, a large part of the additional food needed can be produced on our present farms, with present plant and equipment, or with only small additions to it, and distributed through existing trade channels. The war years demonstrated clearly that given an outlet for its products the agriculture of the United States can expand at least two or three per cent a year certainly at no increase in unit costs, and probably at a decrease, for the next decade or two. Some additional production would be at increasing cost, but more of it would be at decreasing costs. In general, advance in agricultural technology continues to be retarded in the United States by lack of outlets for farm products.

The safest procedure in analysis of such a question is to set up national "models" or budgets of receipts and expenditures in which the effects on national income of any proposed expansion of food consumption and production is tested on the basis of the best evidence available. The full answer, however, may require some heroic estimating of real and long-run effects as distinguished from pecuniary and short-run effects.

Such analysis must be, of course, in terms of the expanded production, distribution, and consumption of particular foods and not of food in the aggregate.

The starting point in any such model-building should be, it follows from our hypothesis, consumption and not production. The first step is deciding what foods must be consumed in larger quantities to improve diets in the ways most essential. The goals therefore will be consumption goals first, and production goals only as more or less ancillary thereto. This calls for a definite change in point of view. In the goal-making thus far done in the United States, the goal-makers have commonly been in a position where they have needed more of some products than the country could or would provide and have tempered their goals accordingly. Thus never after the first year of the war did they set the goals for milk production within five to ten billion pounds of what this country and the allied nations would have used. In the goal-setting needed

for the future in the United States, if nutrition is to figure as it should in the formulation of agricultural programs, it will usually be the quantities that can be made to move into consumption that will set the limit of the goals. The goals must be the amounts that can be expected to be consumed in the United States, plus what can be expected to go into export, counting in whatever of such exports as are arranged through the ERP or similar plans, or at concession or Class II prices. On occasion these goals may need to be tempered, even in the United States, by difficulties in expanding production as needed, or as rapidly as needed, but only on occasion.

The level of the goals will therefore depend upon the vigor with which measures for improving diets and expanding consumption are prosecuted, and the nature of these measures. If education alone is relied upon, it will need to be highly specific in terms of particular foods needed by particular groups, or it will make little headway at the best. If important gains are to be made in a few years, the education will need to be supplemented by direct distribution measures, such as school and institutional feeding, distribution to expectant and nursing mothers and pre-school children of low-income families, in-plant feeding, and the like.

A general comment on education is needed here. The education accompanying the agricultural action programs of the past fifteen years has been highly inadequate, and even incompetent in many situations. The farmers participating in these programs have commonly had only a very superficial understanding of their real objectives. They may have known enough about them to escape the penalties of non-participation, or to take advantage of any handouts in cash or in kind. But only an occasional farmer has had enough insight into their purposes, mechanism, and workings to take a proper part in the shaping of these programs.

The education for the success of an action program can be organized along either of two lines. One is for the action agency to conduct its own education. The other is to rely upon the established educational agencies for these services. Surely the latter is the preferred method. But if it is to be successful the educators must themselves fully understand the programs. This they will do only if they themselves take an active part in their designing. Applied to agriculture in the United States, the foregoing means that the Agricultural Extension Service must take part in all agricultural program making, at all levels, national, state, and local. And even

this may not be enough. It probably will need to arrange schools and train its personnel expecially for educational work on these programs.

It follows from the foregoing that the larger emphasis in such education needs in the future to be upon consumption and bringing consumption up to the goals set. But it must also include attention to adjustments in production to meet production goals. At the farm end, the farm-and-home planning now being promoted within the Agricultural Extension Service is well suited to the needs of such a combined agricultural and nutrition program. But the larger part of the needed consumer education is at the urban end, and this country is very poorly equipped at present to provide this.

The next major point is that the larger part of such combined consumption and production goal-making needs to be at the local and state level rather than at the national level. Certain major national and international considerations need to be taken into account, but in the main any national goals set up should be summations of local goals.

What the local area unit should be for such goal-making is not easy to define. Counties frequently will not fit the situation. Much of the planning must be for foods locally produced for local consumption—especially of such foods as locally-grown vegetables and fruits and fresh milk. There should be nothing in the nature of a philosophy of local self-sufficiency in such planning. Nevertheless, to the extent that any area can feed itself better and with less cost with its own foods than with shipped-in foods, it should plan to do exactly this. It may even be that some nearby truck-and fruit-growing areas have the land and labor available in the summer months for local quick-freezing of part of the vegetables and fruits to be sold in local stores over the winter. Counties will not be proper units for such planning around our large cities. Neither will they ordinarily be for fresh milk production and distribution. In such situations, state agencies must obviously take a hand in the planning and bringing the counties and cities together.

This is a good point at which to introduce the issue often raised of use of supplementary food distribution as a way of adding needed foods to diets vs. as a method of disposal of surpluses. The production should be planned to provide the foods needed for improving the diets. But the best possible planning will not keep local surpluses of some foods from occurring; nor unduly large

supplies of products of other areas producing for outside markets. Given such surpluses, supplementary food distribution machinery should be used to move them into consumption in every possible way consistent with improving diets. This may mean consuming unusually large quantities of some foods for short periods, home canning and local quick-freezing programs and the like.

If the planning needs to be local in large measure, over-all analysis of a few sample or model diets or food budgets can serve little purpose except as an illustration of methodology. The diets and food budgets need to be in terms that fit locally produced types of foods together with those that can be produced to best advantage elsewhere. They need to be analyzed by income groups, by urban and rural, and perhaps even by occupation and other groups. The general nature of food budget analysis is not organically different from that of budget analysis for farms. It needs to start with the present composition of these budgets and test out the effect on the adequacy of the diets, on food expenditures, and on proportions of income spent on food, of various substitutions in the budgets that promise to utilize more effectively the food-producing resources of the area and community, plus the goods advantageously brought in from outside. For farm family planning, the food producing resources of the individual farm need to be utilized in such analysis. Just as in farm budgeting, certain limitations must commonly be taken as given—such as the farm working force, and frequently the land within the present farm— so must certain limitations be accepted in any replanning of food budgets. In the short run at least, one must ordinarily accept some types of food habits as more or less given. But school-feeding budgets, for example, need to be strongly pointed in the direction of better food habits.

For a program such as outlined in the foregoing—one that interrelates food consumption and food production—some major change in organization and administration will be needed.

First, the name PMA should be changed to PDA (Production and Distribution Administration) and the organization from the top all the way down to the county, and above all at the city and community level, needs to include personnel competent to deal with food distribution and consumption as well as with food production and selling. All committees need to have representatives of consumer groups.

Second, the programs of local food production, distribution and

consumption need to be locally devised so far as possible. They should not be programs imposed from above, except in so far as certain major guide lines are laid down, such for example, as those made necessary by limitations of the budget.

Third, it follows from the above that the local program-making should be part of the educational process described earlier. This means that the Extension Service should take a vigorous part in it.

One should not conclude a discussion of the subject in hand without relating it to present legislative proposals. Logically first in this connection in the list of these proposals should come the Aiken Food Allotment Bill even though it is not being promoted at this time. The forty per cent of each family's income to be used in that proposal as a standard for determining its need for food supplements may indeed serve as a general over-all guide for such supplements. But the list of foods to be used in determining the cost of a minimum adequate diet should be a locally differentiated list of foods, and the foods made available as supplements should be planned in advance and included in the local production programs. Both of these procedures are allowed for essentially in the Aiken Bill.

The U.S.D.A. Long-Range Program prepared by Secretary Brannan's Committee as already indicated begins with a strong statement in favor of expansion of consumption as against restriction of production, and lists all the several forms of supplementary food distribution as means to achieving such expansion. But it outlines very little in the way of procedure for integration of consumption and production, especially locally. The administrative organization suggested is not conceived with such integration in mind. The most striking observation to make with respect to this program is that its consumption goals—if it is proper to refer to the consumption criteria set up in these proposals as goals—are not at all appropriate for any realistic program of consumption-production adjustment. The average food consumption of persons with $3,000 incomes at present price levels ($2,000 in 1941) would call for a per-capita food consumption with an index of around 135 compared with 116 in 1947. A program of locally adapted food budgets such as outlined in this paper would give us an index of probably no more than 120 to 125.

The Aiken Bill before the Senate last session (S. 2318) omitted, for reasons of legislative strategy, any new provisions for con-

sumption adjustment. The program planning was for production only. But the structure of national state and county councils set up in this Bill was of a type that could readily be adapted to include planning for consumption also. The Hope Bill of course did not pretend to deal with anything except production and land use, and the organization structure it proposed was not suited even to deal with production adjustment if by this we mean to include adjustment to the market. Of course all administrative provisions of this sort were omitted from the bill finally passed.

A word may need to be said in conclusion as to the incidence of such a program on agricultural income. Distinction between the short-run and long-run is crucial in this connection. If all agricultural production were of the annual crop type, once such a crop was produced, any movement of an additional fraction of it into consumption might indeed raise prices and income of that crop in the 3-to-1 ratio now commonly designated. But dairy and poultry production may respond somewhat to higher prices within a year, with the result that the composite equilibrium price may be somewhat lower than indicated by the 3-to-1 ratio. Surely over a space of three to five years, the response of production would move the equilibrium price well down toward former levels. Nevertheless, the combination of somewhat higher prices and larger volume of output ($P \times Q$) would represent an important addition to farm income.

If agricultural programs can be developed along these lines for the United States, they surely can for many other countries. The United Kingdom, Denmark and Sweden could reasonably be expected to travel in this direction twice as fast as the United States. Some of the severely handicapped countries will need help. The United States and other more fortunate countries working through FAO can very advantageously give them the needed help. Many farmers in the United States can even afford to produce and sell some additional output to other countries at Class II prices—they need figure in terms only of the additional cost of such additional output. But strong leadership in the World Food Council is needed if much headway is going to be made along such lines

THE EFFECT OF SIZE OF HERD ON MILK PRODUCTION COSTS

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DAIRY farming is typically a small scale enterprise. In important dairy states such as Minnesota, Michigan, Massachusetts, Ohio, and Iowa herds of five to nine milking cows were more common than larger herds as late as 1944.[1] Of the 48 states only Wisconsin, New York, Vermont, and Connecticut, reported more farms with ten to fourteen than with five to nine cows milked. The number and proportion of farms reporting a higher number of cows in the milking herd drops rapidly in all states. Vermont and New Jersey were the only states reporting more farms with herds of 15 to 19 cows milked than with 10 to fourteen cows milked. For the United States as a whole the percentage of farms reporting different sized milking herds in 1939 and 1944 is as follows:

Size of Herd	Percentage of All Farms Reporting 5 or More Cows Milked	
	1939	*1944*
5 to 9 cows milked	60.9	53.2
10 to 14 cows milked	22.2	24.4
15 to 19 cows milked	8.6	10.9
20 to 29 cows milked	5.6	7.7
30 and over	2.7	3.8
	100.0	100.0

In the important dairy areas of New England and the Lake States herds of 10 to 19 cows produced 29 to 49 percent of all milk produced in 1944. The percentage of total milk production contributed by the various sized herds follows:

Size of Herd	Percent of Total Milk Production 1944	
	Michigan Minnesota Wisconsin	Connecticut Massachusetts New York Vermont
Less than 10 cows	20	10
10 to 19 cows	49	29
20 to 29 cows	22	26
30 Cows and over	9	35
	100	100

[1] United States Department of Commerce, *Special Report 1945, Sample Census of Agriculture*, Table 1.

The purpose of this paper is to analyze the effect of the predominance of small dairy herds on milk production costs. How and to what extent are milk production costs affected by the size of the milking herd? Milk and butterfat production costs have been computed in a number of states for the last 30 to 40 years. Usually not over 75 farms are included in the computations in a state in any one year. Often averages have been computed for as few as 10 to 25 farms. The small number of cases has usually limited the analysis to the computation of average feed, labor, depreciation, housing, and miscellaneous costs per cow or per hundredweight of

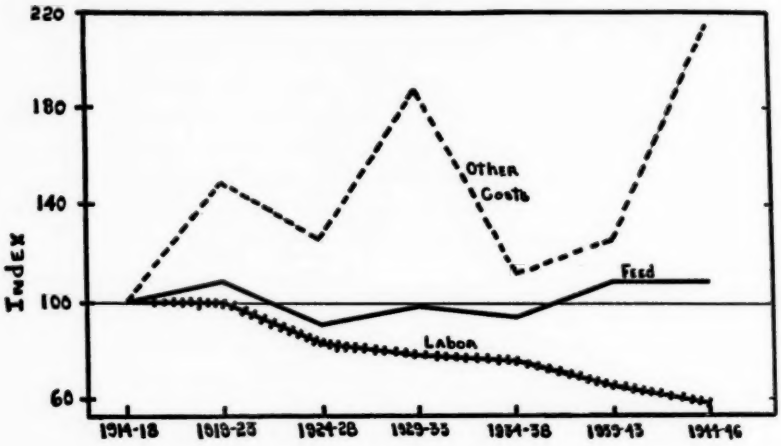

FIG. 1—FEED, LABOR AND OTHER COSTS PER 100 POUNDS OF MILK PRODUCED, 1914–1946

Feed and labor costs are indexes of physical quantities used. The index of other costs is the value of other items used in production deflated by the index of prices paid by farmers for commodities used in farm production. Costs other than feed and labor make up around 20% of the total. Basic data from Cornell Extension Bulletin 439, Ithaca, New York.

milk produced. These costs varied from year to year and state to state depending on the relative prices of the cost items and the customary dairy production practices.

Where sufficient farms were included in the study, costs for high production herds often were compared with those for the low producing herds. Throughout the entire period covered by cost studies, high producing herds have produced milk at lower costs per hundredweight than the low producing herds.[2]

[2] A recent study showing this relation is published in *Michigan Farm Economics*,

These studies also have been useful in indicating trends in production costs where comparable records have been obtained over a period of years. One of the longest series of comparable data is available in New York. These data shown in Figure 1 indicate little change in feed used per hundredweight of milk produced from 1914 to date, although milk production per cow has increased around 40 percent. Labor used per cow has declined nearly 20 percent which results in a substantial reduction in labor per 100 pounds of milk produced. Housing, depreciation, and miscellaneous costs, which make up only around 20 percent of the total, have increased somewhat.

Few if any of these studies have attempted detailed analyses of the effect of the number of cows in the milking herd on milk production costs. At most they usually present a cross classification table showing average milk production and averages of specific cost items per cow for herds with different numbers of cows.[3]

Although there is considerable variation from year to year and between areas, the studies indicate that feed costs make up 50 to 55 percent of the total cost of producing milk. Labor costs account for 25 to 30 percent; housing 3 to 6 percent; depreciation on the milking herd 0 to 5 percent; interest 5 to 7 percent; equipment 2 to 3 percent; breeding service 3 to 5 percent; and miscellaneous costs including veterinary service from 0 to 10 percent.

It is obvious that a number of items of cost when expressed on a per cow or per hundredweight of milk basis are not affected by the size of the herd. Under farm conditions the items which fall in this category are feed, depreciation on the milking herd, and interest. These items usually make up around 60 percent of the cost of producing milk. Thus we have only 40 percent of the total costs subject to variations with the number of cows in the milking herd. Labor accounts for most of these costs which vary with the size of the herd.

East Lansing, Michigan, March 1947. It shows the following variation in cost for 1945–1946.

Herds with	Cost Per Cwt. Milk
Under 250 lbs. butterfat per cow	$4.38
250 to 299 lbs. butterfat per cow	3.60
300 to 349 lbs. butterfat per cow	3.43
350 and over lbs. butterfat per cow	3.40

[3] See for example Table 8 in Extension Bulletin 308, State College of Washington, Pullman, Washington. Bulletins 511 and 515 of the Agricultural Experiment Station, University of Illinois, Urbana, Illinois, are two other recent dairy production cost studies which briefly mention the effect of size of dairy herd on costs.

With this in mind the Wisconsin Agricultural Experiment Station and the Bureau of Argicultural Economics in 1947 made a special study of labor utilization in milk production. One hundred twenty farmers were interviewed in four well distributed areas in the state. Most of the farmers in south-eastern Wisconsin were selling fluid milk in the Chicago milk market. The farmers in the other three areas sold fluid milk for manufacturing purposes. In order to get a representative sample of farms with herds in each size group, farms were selected at random to obtain 24 farms each having 10 to 14 cows; 15 to 19; 20 to 24; 25 to 29; and 30 cows or over.

Each farmer was interviewed twice, once during the winter milking season and once during the summer pasture season. Information was obtained on the labor used for all livestock choring operations as well as for the milking herd. Detailed information on the time used for specific operations such as putting down silage, feeding, grain, etc. was obtained on a number of the farms. Labor required for milking was obtained separately from the other dairy chores for each farm in the study.

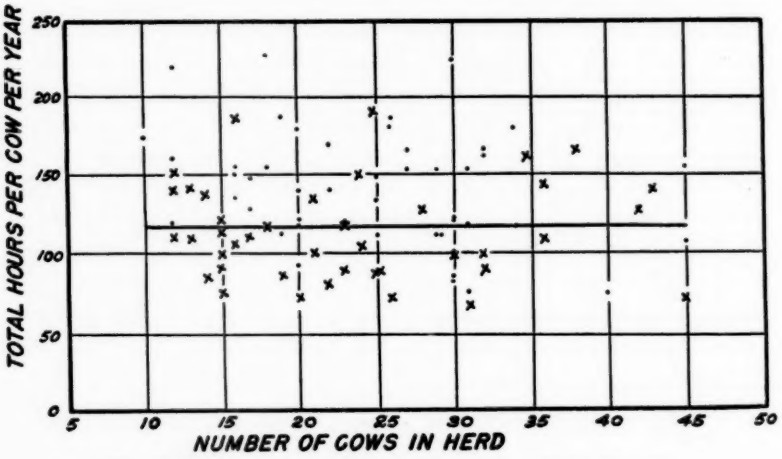

FIG. 2—MAN LABOR USED PER COW, HERDS OF 10 TO 45 COWS

Each dot or cross represents the man labor required per cow for a herd of milking cows. The crosses represent herds where two mechanical milking units are used per person milking. Dots represent herds where there is more than one person milking for each two single units. A horizontal trend line is fitted to the crosses and shows no change in labor requirements per cow when the most efficient milking methods are used on both small and large herds. Most of the reduction in labor requirements per cow for the larger herds results from the use of more efficient milking methods.

A simple cross classification of the data or scatter diagram showed the usual small decrease in labor required per cow in the larger vs. the smaller herds, but this proved to be the least significant part of our findings (Figure 2). When the farms were grouped on the basis of choring methods, we found labor was economized more frequently on the large herds because of a more efficient organization of the work. But where the operators used efficient choring methods on the small herds little difference in labor requirements per cow were observed between the small and large herds. The organization of the milking process was by far the most

TABLE 1. LABOR REQUIRED FOR MILKING AND OTHER CHORE LABOR, HERDS GROUPED BY SIZE AND MILKING EQUIPMENT

Size of Herd	Number of farms	Man hours used per cow		
Two mechanical units used per milker		Milking	Other	Total
10 to 19 cows	16	51	69[1]	120
20 and over	20	51	65[1]	116
Less than two mechanical units per milker				
10 to 19 cows	13	82[2]	69[1]	151
20 and over	23	75	65[1]	140
All hand milking				
10 to 19 cows	17	113[2]	69[1]	182
20 and over	13	106	65[1]	171

[1] Average of hours of man labor required for other dairy chores on all farms having herds of specified size without respect to organization of milking process. This difference is not statistically significant.

[2] Differences not statistically significant.

important factor influencing labor requirements per cow. Herds which were milked with one man operating two single units (or one double unit) had a labor requirement for the milking process of 51 hours per cow per year. The same time per cow was required for the larger as for the smaller herds.

In contrast an average of 78 hours of labor per cow for the milking process was used in herds milked with mechanical milkers where more people helped in relation to the mechanical milking units used. The herds that were hand milked required 110 hours milking time a year per cow. The man hours required for milking and for other chores for herds of different sizes using comparable milking methods are shown in Table 1.

A further analysis of the influence of milking techniques on labor requirements indicated that machine stripping, practiced on 9 of the farms, saved around 2 hours per cow per year, or 2 percent of the total labor as compared with the most efficient organization of the chores where hand stripping was practiced.

Probably one of the most interesting conclusions reached in this study is that labor available is an important determinant of labor used in milk production. Members of the family furnished all the labor used on most of the farms studied. Often several of the boys or girls and wife helped with the chores. When the farms were grouped on the basis of number of cows in the herd per person doing chores, labor used per cow per year dropped as follows:

Cows per person doing chores	Number of farms	Hours labor per cow per year
Under 10	39	182
10 to 14	39	138
15 to 19	28	112
20 and over	18	87

Overhead Labor 180 Hours Per Head Per Year

Most of the labor used in milk production varies directly with the equipment used and with the number of cows in the herd. Each day, however, a certain amount of time is spent in cleaning and assembling the milkers, going to and from the dairy barn, taking the cows to and from pasture in the summer and hitching up to clean the barn in winter. These operations which require a certain amount of time regardless of the size of the herd are estimated at 180 hours per herd per year. On a 10 cow herd the average is 18 hours per cow; this overhead time drops to 12 hours per cow per year for 15 cow herds, and 9 hours per cow for 20 cow herds.

Herds of less than 15 cows can be milked with a single mechanical milking unit. A number of farmers with 6 to 12 cows use such equipment. From the standpoint of economy of time, however, two single mechanical milking units are a profitable investment for herds as small as 10 milking cows. Thus farmers with herds as small as 10 cows could profitably use the most efficient milking equipment used by farmers with larger herds. Hence the only necessary source of increased labor requirements per cow in the smaller herds is the increased overhead time per cow. The decrease

in labor per cow may amount to 6 percent of the total as the number of cows milked is increased from 10 to 15 cows, but the percentage decrease drops sharply as cow numbers are increased from 15 to 20, 25 and 30. An increase in the number of cows milked from 20 to 30 would reduce total labor requirements per cow by 3 percent.

Labor Saving Equipment Profitable for Small Herds

We have already pointed out that a two cow unit mechanical milker is a profitable investment on farms with herds as small as 10 cows where it is profitable to economize on labor. For the most part this holds true for other types of labor saving dairy equipment. Drinking cups for the cows increase milk production as well as reduce labor. Where water can be piped to the barn at reasonable cost, drinking cups are a profitable investment for small as well as large herds. This also holds for feed carts and most other equipment.

Many farmers with as few as 15 cows have driveway barns. These save as much as 2 to 3 hours per cow per year over the use of a litter carrier or wheelbarrow in cleaning the barn. It is doubtful if this labor saving method of cleaning the barn is feasible where fewer than 15 cows are kept. But it is equally available for all herds of this size and larger.

The mechanical barn cleaner currently being installed in old dairy barns at a very rapid rate reduces barn cleaning time. These cleaners themselves vary in price, and the necessary barn remodeling to provide an enclosure for sheltering the spreader and tractor varies widely from farm to farm. Most installations cost from $1000 to $2000 per farm. Obviously this equipment is too expensive for the smaller herds. Since a mechanical barn cleaner only saves around two hours per cow during the seven months that the cows are stabled (or 40 hours on a 20 cow herd) compared with the center driveway, it follows that labor must be worth about $3.00 per hour in order to make a barn cleaner profitable—with savings of four to five hours per cow in comparison with the use of a litter carrier, labor must be worth $1.50 for profitable barn cleaner operation. Mechanical barn cleaners make dairy farming more pleasant but under normal farm conditions where the barn is cleaned once a day it will not lower costs as compared with a center driveway arrangement on herds as large as 30 cows.

Housing Cost Per Cow

Building costs per cow in recent years have been calculated in various studies[4] at $8.00 to $10.00 per cow a year. This amounted to 3 to 6 percent of the gross cost of keeping a cow. The size of herds varied from 16 to 20 cows in these studies. As indicated earlier, data are not available showing the reduction in building costs per cow when one goes from a 10 cow herd to a 20, 30, or a 40 cow herd. Indeed with the variety of barn types that are used and the variations in construction costs at different times, it would be difficult to obtain reliable information on the effect of herd size by the usual methods of cost determination.

The following analysis of building costs is believed to be useful. Considering a common type of dairy barn for housing all cattle, having two rows of stanchions, calf pens, box stalls, center driveway, and hay loft, we know that with a standard width of 36 feet, the cost of a barn 80 feet long will not be double that of a barn 40 feet long. Essentially the two ends are fixed costs. The sides, ground floor, interior equipment, hay floor, and roof costs vary with the length of the barn. If we can approximate the costs of these parts of the barn, we can arrive at useful estimates of the housing cost per cow with various sized herds.

Thus if the roof and walls of a barn 40 feet long cost $2,000 when it was built, the cost of the ends would be close to $400 or 20 percent of the total. An 80 foot barn on the same basis would cost $3600. A 120 foot barn would cost $5200. Assuming 20, 40, and 60 cows in each of these barns the investment per cow would be $100 for the 40 foot barn, $90 for the 80 foot barn, and $87 for the 120 foot barn. Present day building costs would be higher. The annual building expense would be proportional to the investment; housing costs per cow in the 40 unit barn would be 90 percent as high as in the 20 unit barn. Housing costs in the 60 unit barn would be 87 per cent of the housing costs per cow in the 20 cow barn. If the housing costs represent 5% of the cost of producing milk in 20 cow herds, they would be reduced by .5% in the 40 cow herds and .8% in the 60 cow herds—less than 1 percent variation in milk production costs arise out of variations in housing costs of small vs. larger herds.

[4] Michigan State College F.M. 397, Illinois Agrl. Experiment Station Bulletin 511.

Milkhouse and Equipment Cost Per Cow

Ordinarily equipment costs amount to less than 3 percent of the total cost of producing milk. This is especially true in areas that produce milk for butter, cheese, or other manufactured dairy products. There are a few fluid milk markets, especially in the east, however, which require a three-room milk house, electric cooler, steam boiler, steam cabinet, and special steam cabinet for milking machines. Fluid milk areas with the high cost requirements in milk house and equipment have an investment of $2000 or more, and annual expense of $200 and over per farm. These costs are almost the same regardless of whether 10 cows or 60 cows are kept on the farm. Where equipment costs are at this level they may amount to $10 per cow in a 20 cow herd, or 4 or 5 percent of total milk production costs. Equipment costs at this level would be $20 per cow for 10 cow herds, but only $6.67 per cow in 30 cow herds. An increase in herd size from 10 to 20 cows could reduce milk production costs 2 to 2½ percent under the conditions outlined above. Further increases in herd size might reduce costs another 1 percent. Outside these milkmarketing areas with unusually high requirements, however, the investment in equipment is $1,000 or less per herd and equipment costs run in the neighborhood of 5 cents per hundredweight of milk produced. It is obvious that only small savings in equipment costs can be achieved by increasing the size of the herd milked.

Saving Slight in Larger than 15 Cow Herds

In summarizing the small possible savings outlined in the preceding paragraphs, it appears that if the most efficient methods are used in producing milk, production costs may be lowered around 5 percent in 15 cow vs. 10 cow herds; 2 to 3 percent in 20 vs. 15 cow herds; 2 to 5 percent in 25 vs. 15 cow herds, and slightly more in the 30 cow herds. From a practical standpoint one concludes that there are no significant cost reductions possible as the size of the herds is increased beyond 15 cows. In an attempt to determine the economies and diseconomies of producing milk in extremely large herds, several herds of 100 cows or more were studied. Extra time required in moving the feed and milk greater distances in the large barns, in taking the cows greater distances to and from pastures, and in hauling crops and manure greater distances to and

from fields offset time savings at other jobs such as washing milkers and cans and throwing down silage. Farmers with herds of 100 cows or more have additional labor supervision problems and their disease control problems appear to be greater than on smaller herds.

Larger Herds Have Better Management

In the more specialized dairy areas and in city milk markets 20 to 40 cow dairy herds are more common than elsewhere. One of the reasons for this is the higher level of managerial ability developed in the more specialized dairy areas. Milk production has a greater comparative advantage over other enterprises in these areas too. Without doubt, on the average, the larger dairy herds enjoy better management than small herds. This is true in each of the important dairy states as well as for the United States as a whole. This includes better feeding, better and more regular care and better breeding. The results are indicated in the range in milk production per cow for cows in different sized herds in the state of New York and the entire United States as reported in the 1945 census.[5]

Cows in Herd	Pounds Milk Produced per Cow	
	New York	U.S.
5 to 6	4,790	4,085
7 to 9	5,520	4,490
10 to 14	5,900	4,870
15 to 19	6,020	5,375
20 to 29	6,190	5,790
30 and Over	6,330	6,520

When one examines the critical management factors in milk production, however, herds as small as 10 to 15 cows will pay for good management. Artificial insemination associations now make it possible and economical to use as well-bred sires on small herds as are used on the larger commercial milk producing herds. Liberal feeding of balanced rations and timely milking is just as profitable for small as for large herds.

Feed Production Costs Lower for Large Farms

Most milk is produced from home produced feeds. The size of the dairy herd often is determined by the amount of crop land on the farm and the hay and pasture produced. Where this is the case, economies in producing the crops associated with farming larger acreages might be considered a part of the general problem. Looked

[5] Special Report, *1945 Sample Census of Agriculture.*

at from this standpoint milk produced in small herds on small farms may cost considerably more than where the herds and farms are larger.

Data from farm account studies indicate that power and machinery expense and man labor cost may be reduced by as much as 25 to 30 percent per acre of crops raised as the acreage of crops per farm is increased from 80 to 200 acres.[6] These items, power, machinery, and labor, account for approximately half the costs of crop production. Clearly there are substantial cost reductions in crop production as the shift toward larger acreages continues. Cost reductions are also possible as better management practices are introduced—both for the small and larger herds. But unless new technologies are developed, milk production costs will not be lowered significantly merely by shifting to larger milking herds.

[6] Savings of this magnitude are indicated on Illinois farms. See Table 8, *Illinois Farm Economics*, July–August, 1947, University of Illinois, Urbana, Illinois. Because of the higher proportion of hay on dairy farms and the lack of labor saving hay harvesting methods, savings may be somewhat smaller on dairy farms.

ALLOCATION OF AGRICULTURAL INCOME*

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DESPITE extensive improvements in the available data on agricultural income over the past 15 years, it is still true that we know relatively little about the distribution of agricultural income. Most of the efforts in estimating agricultural income have been devoted to determining agriculture's share in the national income or the income of farm people from farming. These endeavors are obviously necessary first steps. However, the income data required to provide the necessary information for many types of research work and policy formulation are still lacking.

The additional data on agricultural income need to take two directions. One is to determine the functional distribution of agricultural income, i.e., the allocation of agricultural income among the factors of production. The other is the personal (family) distribution of agricultural income.[1] The first is important in analyzing the allocation of resources, while the second is significant in a welfare context.[2]

The major purpose of this paper is to develop a series of estimates of the functional distribution of agricultural income. Though major emphasis is given to net agricultural income, some attention is devoted to the allocation of gross agricultural income. In addition an attempt is made to derive estimates of the net income of commercial farms, defined here to include the 50 percent of American farms producing 85 percent or more of total agricultural output and employing the great bulk of all non-labor resources. It is recognized that the results obtained in all cases depend to a considerable extent upon the particular assumptions chosen to derive the estimates. As a consequence care is taken to spell out the assumptions very specifically.

* I wish to acknowledge the criticisms and comments of T. W. Schultz and William H. Nicholls.

[1] Since the first draft of this paper was written (early in 1945) much work has been done in the U. S. Department of Agriculture to obtain data to accurately estimate the personal distribution of income in agriculture.

[2] Cf. T. W. Schultz, "Income Accounting to Guide Production and Welfare Policies," a paper read before the Western Farm Economics Association, June 28, 1945 and published by the Association, and D. Gale Johnson, "Contribution of Price Policy to Income and Resource Problems in Agriculture," THIS JOURNAL, XXVI (Nov., 1944), pp. 637–8; 651–2, and 658–9.

I. Allocation of Net Income

The allocation of income is estimated on both a net and gross income basis. Since there is little difficulty in allocating gross income once the net income is allocated, major attention is given to allocating net income.

A. The Assumptions

Estimates of the functional distribution of net agricultural income present a number of difficulties. A very large proportion of all types of agricultural resources do not receive a market return nor have a market determined price. If only one resource were not hired, the return to that resource could be obtained as a residual. With a corporate form of enterprise usually only the capital is supplied in whole or part by the firm, with both "management" and labor being hired. As a consequence a division of income along functional lines can be made with only moderate errors. In agriculture some firms own or control all resources employed and no direct market prices are available. Other firms own part of the land, all of the non-land capital and supply directly all of the labor. In only a limited number of cases would all of the land be rented and all labor hired. As a result a number of assumptions must be made in deriving the estimates.

The basic income series for the calculations is net income from agriculture.[3] This concept is an estimate of the total income produced by agriculture—agriculture's contribution to the national income. Net income from agriculture is the sum of net operator income[4]—including adjustments for changes in value of inventories — wages paid, rent to landlords not on farms,[5] and farm mortgage

[3] Net income from agriculture is seldom used in income comparisons, though it has much to commend it from an analytical standpoint to the somewhat similar concept of net income to persons on farms from agriculture. The magnitude of the latter concept is affected by such considerations as shifts in ownership of land or changes in residence of hired workers.

[4] All income estimates given in this paper include government payments.

[5] The Bureau of Agricultural Economics currently excludes rent paid to landlords living on farms as a production expense to farm operators, though rent paid to landlords not living on farms is considered a production expense. The reason for excluding rent paid to landlords living on farms has been stated as follows:

"Rent to landlords living on farms is not included in expenses because, while it is an expense item to one farmer, it represents an item of income to another." (Net Farm Income and Parity Report: 1943, p. 25).

Consistency would require a similar exclusion of wages paid to laborers living on farms or at least wages paid to farm operators, as a production expense as such wages represent income to other farm people, in many cases to other farm operators or members of their families. It would seem more reasonable to include rent, regardless of the recipient, as a production expense in determining farm operator's income. If this were done, farm operator income would be the net income of all farm operators from the farms over which they have managerial control.

interest. One minor agricultural income item, interest on non-real estate debt, has not been included because the official statistics do not separate it from a large category of miscellaneous items. However, the resulting error is small.[6]

Three different combinations of assumptions have been used in estimating the division of agricultural income among the resources.

A. The return to land was estimated by "blowing up" the total net rent on rented land to include all land. The extension was made by assuming that the net rent on rented land would bear the same relationship to the total net return on all land as the value of rented land did to the value of all land for each year. The estimates of the relationship of the value of rented land to all land were based on census data, with interpolations being made for intercensus years.[7] The returns to capital were calculated by multiplying the value of non-real estate inventories on January 1 of each year by an estimated rate of interest. The rates of interest used were 6 percent for 1910 to 1934, 5.5 percent for 1935 to 1937, and 5 percent from 1938 to date. The returns to labor were determined as a residual, being the difference between net agricultural income and the computed returns for land and capital.

B. The return to land was determined by multiplying the annual average rate of interest on farm mortgages by the estimated

[6] A. S. Tostlebe, et al, "The Impact of the War on the Financial Structure of Agriiculture," U. S. Dept. of Agriculture, Misc. Pub. No. 567, 1945, pp. 25, 26. presents estimates of interest payments on non-real estate debt for 1915, 1918 and 1940 to 1943 (pp. 25–6). Inclusion of interest payments on non-real estate debt would have increased total agricultural income by about 5 per cent in 1915, 3 percent in 1918 and 4, 3, 2 and 2 percent respectively in 1940, 1941, 1942, and 1943.

An offsetting error, which was not discovered until after the estimates in this paper were made, is due to the double counting of interest paid on mortgages by non-farm landlords. In recent years this item has been about $60,000,000, or one percent or less of total agricultural income. In all estimates made by the Bureau of Agricultural Economics prior to June 1945, net rent to non-farm landlords included farm mortgage interest payments and the estimates of interest payments on farm mortgages included all farm real estate. As a result, in determining net agricultural income the mortgage interest paid by non-farm landlords was counted twice. In estimates published in June, 1945, net rent paid to non-farm landlords was calculated exclusive of interest payments thus removing the double counting. This resulted in an increase in estimates of operator's income and a reduction in estimates of total agricultural income. This revision is available only for 1940 to date.

It might be noted that compilers of national income statistics are uncertain as to the appropriate status of short-term interest. Short-term interest may be considered as a cost in the same sense as purchases of raw materials; as a factor payment, or as a transfer payment.

[7] Data for 1935–1946 were kindly supplied by Mr. M. M. Regan of the Bureau of Agricultural Economics.

value of farm real estate on January 1 of the current year. The returns to capital were determined as in Method A.

C. To derive an independent estimate of labor returns as contrasted to treating labor as a residual claimant, the assumption was made that all family workers, including the operator, received the same return as hired workers. The income series for hired workers used was the total wage bill paid by farmers. When this labor income series is added to returns to land and capital as calculated under assumptions A or B, the total of the three shares never exactly equals total agricultural income. As a result the labor returns calculated as noted in this paragraph are used only for comparative purposes.

The three combinations of assumptions include most of the procedures used in farm management or farm income studies. A further distinction is sometimes made by separating a management return as a residual after returns to land, capital and unpaid family labor have been estimated. We could, for example, by combining estimated returns to land and capital from Methods A or B and to labor from Method C obtain a residual which might be termed a management return.[8]

B. Method A

The estimated returns to land, capital and all labor as derived from Method A are given in Table I.

C. Method B

The results obtained by applying Method B are shown in Table II.

D. Comparison of Methods A and B

The proportions of the total returns going to land and labor are much more variable under Method B than Method A. This difference results from the assumptions as to the appropriate method of valuing the current contribution of land to total income. Method B assumes that current land values multiplied by the appropriate interest rate indicates the income received by land. However, land values presumably depend upon anticipated returns over an extended period of time and a capitalization ratio that is undoubtedly quite inflexible. In addition, the mortgage rate of interest varies

[8] This step was not taken for two reasons—one, there does not now seem to be an appropriate agricultural wage rate available, and, two, the writer is not fully confident that the estimates of employment of family labor are wholly comparable with those of hired labor. See later discussion for further comments.

TABLE I. ESTIMATED DISTRIBUTION OF AGRICULTURAL INCOME TO LAND CAPITAL AND LABOR ACCORDING TO METHOD A, 1910–1946

Year	Return to land[1]	Return to capital[2]	Return to labor[3]	Total[4]	Return to land	Return to capital	Return to labor
	(Millions of dollars)				(Per cent of total)		
1910	1,659	430	3,159	5,248	31.6	8.2	60.2
1911	1,716	451	2,586	4,753	37.0	8.6	54.4
1912	1,765	440	3,022	5,227	33.8	8.4	57.8
1913	1,767	481	3,052	5,310	33.4	9.1	57.5
1914	1,822	515	3,137	5,474	33.3	9.4	57.3
1915	2,018	532	2,882	5,432	37.1	9.8	53.1
1916	2,556	546	3,185	6,287	40.6	8.7	50.7
1917	3,711	603	5,631	9,945	37.3	6.1	56.6
1918	3,877	761	6,782	11,420	33.9	6.7	59.4
1919	4,117	838	6,854	11,809	34.9	7.1	58.0
1920	2,557	841	6,713	10,111	25.4	8.3	66.3
1921	1,897	695	2,679	5,271	36.0	13.2	50.8
1922	2,215	542	3,671	6,428	34.5	8.4	57.1
1923	2,506	520	4,265	7,291	34.6	6.9	58.5
1924	2,889	531	3,930	7,300	38.9	7.3	53.8
1925	2,632	530	5,368	8,530	30.9	6.2	62.9
1926	2,437	558	5,271	8,266	29.4	6.8	63.8
1927	2,758	560	4,708	8,026	34.3	7.0	58.7
1928	2,663	595	5,117	8,375	31.8	7.1	61.1
1929	2,590	635	5,191	8,416	30.8	7.5	61.7
1930	1,990	630	3,948	6,568	30.4	9.5	60.1
1931	1,221	503	2,896	4,620	26.5	10.9	62.6
1932	858	399	1,960	3,217	26.7	12.4	60.9
1933	1,207	333	2,384	3,924	30.8	8.5	60.8
1934	1,579	341	2,619	4,539	34.8	7.5	57.7
1935	1,854	319	3,976	6,149	30.2	5.2	64.6
1936	1,995	428	4,084	6,507	30.6	6.6	62.8
1937	1,924	436	4,882	7,242	26.6	6.0	67.4
1938	1,696	416	3,998	6,110	27.8	6.8	65.4
1939	1,854	420	4,081	6,355	29.2	6.6	64.2
1940	1,904	423	4,083	6,410	29.7	6.6	63.7
1941	2,693	442	5,893	9,028	29.8	4.9	65.3
1942	3,877	576	8,547	13,000	29.9	4.4	65.7
1943	4,571	773	10,770	16,114	28.4	4.8	66.8
1944	4,892	823	9,896	15,611	31.3	5.3	63.4
1945	4,981	855	9,981	15,817	31.5	5.4	63.1
1946	5,261	894	12,734	18,889	27.9	4.7	67.4

[1] See Appendix Table I.
[2] See Appendix Table III.
[3] Calculated as a residual.
[4] BAE, "Net Farm Income and Parity Report, 1943," (Washington, USDA, 1944) p. 10 and BAE, *The Farm Income Situation*, June–July, 1947, pp. 22. Includes government payments.

TABLE II. ESTIMATED DISTRIBUTION OF AGRICULTURAL INCOME TO LAND, CAPITAL AND LABOR ACCORDING TO METHOD B, 1910–1946

Year	Return to land[1]	Return to capital[2]	Return to labor[3]	Total[4]	Return to land	Return to capital	Return to labor
	(Millions of dollars)				(Per cent of total)		
1910	2,088	430	2,730	5,248	39.8	8.2	42.0
1911	2,163	451	2,139	4,753	45.5	8.6	45.9
1912	2,276	440	2,511	5,227	43.5	8.4	48.1
1913	2,346	481	2,483	5,310	44.1	9.1	46.8
1914	2,415	515	2,544	5,474	44.1	9.4	46.5
1915	2,415	532	2,485	5,432	44.4	9.8	45.8
1916	2,621	546	3,120	6,287	41.6	8.7	49.5
1917	2,775	603	6,567	9,945	27.8	6.1	66.1
1918	3,049	761	7,610	11,420	26.6	6.7	66.7
1919	3,327	838	7,644	11,809	28.2	7.1	64.7
1920	4,045	841	5,225	10,111	40.0	8.3	51.7
1921	3,812	695	764	5,271	72.3	13.2	14.5
1922	3,408	542	2,488	6,428	52.9	9.5	37.6
1923	3,373	520	3,398	7,291	46.3	6.9	46.8
1924	3,179	531	3,590	7,300	43.5	7.3	49.2
1925	3,116	530	4,884	8,530	36.5	6.2	57.3
1926	3,041	558	4,667	8,266	36.8	6.8	56.4
1927	2,906	560	4,560	8,026	36.2	7.0	56.8
1928	2,897	595	4,883	8,375	34.6	7.1	58.3
1929	2,873	635	4,908	8,416	34.1	7.5	58.4
1930	2,873	630	3,065	6,568	43.7	9.5	46.8
1931	2,640	503	1,477	4,620	57.1	10.9	32.0
1932	2,234	399	584	3,217	69.4	12.4	18.2
1933	1,843	333	1,748	3,924	47.0	8.5	44.5
1934	1,852	341	2,346	4,539	40.8	7.5	51.7
1935	1,807	319	4,023	6,149	29.3	5.1	65.6
1936	1,729	428	4,350	6,507	26.6	6.6	66.8
1937	1,703	436	5,103	7,242	23.5	6.0	70.5
1938	1,633	416	4,061	6,110	26.7	6.8	66.5
1939	1,561	420	4,374	6,355	24.6	6.6	68.8
1940	1,548	423	4,439	6,410	24.1	6.6	69.3
1941	1,507	442	7,079	9,028	16.7	4.9	78.4
1942	1,590	576	10,834	13,000	12.3	4.4	83.3
1943	1,703	773	13,638	16,114	10.6	4.8	84.6
1944	1,914	823	12,874	15,611	12.3	5.3	82.4
1945	2,227	855	12,735	15,817	14.1	5.4	80.5
1946	2,501	894	15,494	18,889	13.3	4.7	82.0

[1] See Appendix Table II.
[2] See Appendix Table III.
[3] Calculated as a residual.
[4] BAE, "Net Farm Income and Parity Report, 1943." (Washington, USDA, 1944) p. 10, and BAE, *The Farm Income Situations*, June–July, 1947, pp. 22. Includes government payments.

little from year to year, showing little responsiveness to changing agricultural price conditions. Every element entering into the calculation of land returns as in Method B is very inflexible compared to farm income. Consequently the land returns indicated by this method are only indirectly related to current conditions impinging upon factors influencing the demand for land for use, rather than for ownership. Differences in the estimates of land returns by the two methods may be taken to indicate the gains and losses involved in farm ownership for any particular year. The farm owner will presumably be at an advantage whenever rental payments are greater than the interest cost, and vice versa.

Rental contracts either directly reflect changes in prices and/or yields, as in crop and livestock share leases, or are subject to fairly continuous bargaining.[9] As a consequence, rental rates are likely to more accurately reflect the value of alternative uses of land for any particular year than a return based on a percentage of land value or price.[10]

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[9] For the nation as a whole, rental contracts fixed in cash have covered farms which include approximately 20 percent of the value of all land and buildings on tenant operated farms for the census years 1919 to 1939. In 1920 share-cash rental contracts represented about 15 percent and in 1939 about 25 percent of the value of land and buildings on all rented farms. In the share-cash rental contracts the share proportion of the total rent is generally considerably more important than the cash part. At the outside cash rent would not make up more than 25 to 30 percent of all rent payments. Part owners apparently rent about the same proportion of the rented part of the farm in cash as do full tenants, though data are available only for 1939.

[10] Some doubt may be raised as to the extension of rent on rented land to obtain a return on all land because rented land may not be an adequate representation of all land. The major difficulty arises, the writer believes, because of the differences in regional distribution of rented land. In New England and Middle Atlantic states much less land is rented than in other sections, such as the South and North Central states. The Pacific and Mountain States also have less rented land than the national average. As a consequence, two types of errors are possible. First, the average level of land returns calculated by estimating from rents may be too high or low. Second, the movement of land returns in time can be affected by considerations peculiar to the cotton, hog-corn, or wheat producing areas. Except for unusual circumstances, the second error is not likely to be of importance and the size of the first error is undoubtedly small. The census regions in which tenancy is significant have approximately 75 percent of the value of land and buildings and customarily produce the same proportion of gross and net farm income. Even in the Western States tenancy is undoubtedly of sufficient importance to permit rents to be of sufficient importance to serve as a guide. However, it is probably true that land returns should be estimated on a regional basis and then combined to obtain a national estimate. The method used in this paper resulted in weighting regions in proportion to land rented rather than in proportion to all farm land. A more refined analysis should approach the problem from at least a regional standpoint.

The large drop in the proportion of net agricultural income attributed land in 1920 illustrates the desirability of using regional rather than national data. Rent payments fell very sharply from 1919 to 1920 because of the very large declines in

Theoretically one would expect approximately equal proportionate short run changes in the returns to labor, land, and capital. Only very modest changes are made in the employment of any one of the three resources from year to year. Part of the reason for the small change in employment is due to the inelasticity of the supply of capital, land, and labor; part is due to technical reasons which make more than modest changes in the total employment of capital and land difficult. Were it not for the existence of capital rationing and uncertainty agriculture could have an elastic supply curve for capital, but in actual fact the supply curve is inelastic. In addition, technical reasons make capital transfers out of agriculture difficult; the capital instruments already in agriculture cannot be readily transferred to other uses. New capital that can be added in the short period can constitute only a small proportion of the existing supply. Additions or subtractions to the supply of land can obviously be made only over a considerable period of time. Because of the interrelationships between the demand for and supply of labor, labor employment remains practically constant from year to year. Since the proportions of the various resources utilized in agriculture do not change appreciably from year to year, the changes in the absolute level of returns to each should be approximately equivalent. This result is obtained for land and labor with Method A, and if we could have a more satisfactory procedure for attributing returns to capital, e.g., a market price for the use of capital instruments such as machinery,the theoretically anticipated result might be obtained for all three resources. As a consequence, Method A has been accepted as superior to Method B in estimating returns to land and labor.

Over the average of the 37 years Method B attributes a larger percentage of agricultural income to land than Method A. This difference results from the fact that, particularly during the early years, net land rentals did not provide a rate of return equivalent to the farm mortgage rate of interest. In other words, farm owners were paying more for farm land than the going rental rates, capitalized at the mortgage rate of interest, would indicate as an appropriate valuation during the period. Two possible explanations may be given for the discrepancy. One was the desire for land

cotton and wheat prices in late 1920 as contrasted to more modest changes in milk, fruits, and feed grains and livestock. The rent series is heavily influenced by cotton and wheat prices and thus a distortion resulted.

TABLE III. ESTIMATED TOTAL NET LAND RENTAL, INTEREST CHARGE ON CURRENT LAND VALUATION AND RATE OF RETURN ON RENTED LAND, 1910–1946

Year	Total net land rental[1]	Interest charge on land[2]	Difference	Rate of return on rented land[3]
	(Millions of dollars)			(Percent)
1910	1,659	2,088	−429	4.7
1911	1,716	2,163	−447	4.8
1912	1,765	2,276	−511	4.7
1913	1,767	2,346	−579	4.6
1914	1,822	2,415	−593	4.6
1915	2,018	2,415	−397	5.1
1916	2,556	2,621	− 65	6.0
1917	3,711	2,775	936	8.2
1918	3,847	3,049	798	7.7
1919	4,117	3,327	790	7.5
1920	2,557	4,045	−1,488	3.9
1921	1,897	3,812	−1,915	3.1
1922	2,215	3,403	−1,188	4.1
1923	2,506	3,373	−867	4.8
1924	2,839	3,179	−340	5.6
1925	2,632	3,116	−484	5.3
1926	2,437	3,041	−604	5.0
1927	2,758	2,906	−148	5.8
1928	2,663	2,897	−234	5.6
1929	2,590	2,873	−283	5.4
1930	1,990	2,873	−883	4.2
1931	1,221	2,640	−1,419	2.8
1932	858	2,234	−1,376	2.3
1933	1,207	1,843	−636	3.9
1934	1,579	1,852	−273	4.9
1935	1,854	1,807	47	5.6
1936	1,995	1,729	266	5.9
1937	1,924	1,703	221	5.5
1938	1,696	1,633	63	4.9
1939	1,854	1,561	293	5.5
1940	1,904	1,548	356	5.7
1941	2,693	1,507	1,186	7.7
1942	3,877	1,590	2,287	10.9
1943	4,571	1,703	2,868	12.1
1944	4,892	1,914	2,978	11.5
1945	4,981	2,227	2,745	10.7
1946	5,261	2,501	2,760	10.1

[1] See Table I.

[2] See Table II.

[3] Calculated by dividing estimated net land rental by the estimated value of land and buildings as of January 1 of the current year. Value of land and buildings taken from BAE, "Net Farm Income and Parity Report, 1948" (Washington: USDA, 1944), p. 29 (mimeo.) and BAE, *Farm Income Situation*, June–July, 1947, p. 28.

ownership for what it was presumed to provide in prestige, social standing and security. The other was the anticipated gain from appreciation in land values, particularly from 1910 to 1919.

Table III provides a comparison of the estimated returns for land (in dollars) derived by the two methods and the percentage net rent was of current land valuation.

Three periods of stability in the rate of return from rents should be noted. One was from 1910–14 when the average return was approximately 4.7 percent as compared with a rate of interest of slightly less than 6.1 percent.[11] The second was during 1924 to 1929 with an average net rental return of approximately 5.5 and an average interest rate of slightly less than 6.2 percent. The third period was from 1935 to 1940 when an average rental return of 5.5 and an average rate of interest of 5 percent prevailed.[12]

The very high rates of return during the two war periods and the low rates during the two major depressions are worthy of note. These reflect how far current market valuations of the use of land may depart from the valuation of the land in terms of ownership. This in turn reflects the extent to which long run considerations override the short run in the case of land prices.

The above estimates of returns to land may be used to make certain judgments about the long run feasibility of current levels of land values. Assuming that land will continue to receive 30 percent of the total net agricultural income and that the capitalization rate is 5 percent, net agricultural income will have to average $10 billions to support a total value of land and buildings of $60 billions.[13] If the capitalization rate is 6 percent, net agricultural income would have to be $12 billions. These incomes should be compared with $9.0 billions in 1941; $13.0 billions in 1942; $15.8 billions in 1945 and $18.9 billions in 1946.

The Department of Agriculture has estimated that under full employment conditions in a normal post war year with retail prices at the 1943 levels net agricultural income would be about $12–12.5 billions. Under conditions of intermediate employment net agricultural income was estimated at about $8.5 billions.[14]

[11] See Appendix Table II for farm mortgage interest rates.

[12] These results are approximately the same as those reported by M. M. Regan, H. R. Johnson and F. A. Clarenbach, *The Farm Real Estate Situation*, 1944–1945. Circ. No. 743, Washington: U. S. Department of Agriculture, 1945, pp. 37–38.

[13] As of January, 1947 the value of farm real estate was estimated to be 58,604 million dollars. See *Farm Income Situation*, June–July, 1947, p. 28.

[14] *What Peace Can Mean to American Farmers, Post-War Agriculture and Employment*, USDA, Misc. Pub. No. 562, p. 25. Writer adjusted published estimates of net operator income to net agricultural income.

If the general price level remains at or above the 1943 level, it certainly is not outside the realm of possibility that net agricultural income will average in excess $10 billions. It is, of course, impossible to say at this time whether the level of land values of late 1946 are generally too high. However, it does seem clear that much of the alarm over rising land values has been unwarranted. Perhaps such alarm and the associated propaganda were important in preventing greater increases than actually occurred. In any case, it seems clear that farmers who bought land as late as the spring of 1945 have made rather excellent purchases.[15]

TABLE IV. ESTIMATED PERCENTAGE DISTRIBUTION OF AGRICULTURAL INCOME, COMPARISONS OF METHODS A AND B, 1910–1946

Period	Method A			Method B		
	Land	Capital	Labor	Land	Capital	Labor
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
1910–14	33.8	8.7	57.5	43.4	8.7	47.9
1915–19	36.7	7.7	55.6	33.7	7.7	58.6
1920–24	33.9	8.8	57.3	51.0	9.0	40.0
1925–29	31.4	6.9	61.7	35.6	6.9	57.5
1930–34	29.8	9.8	60.4	51.6	9.8	38.6
1935–39	28.9	6.2	64.9	26.1	6.2	67.7
1940–44	29.8	5.1	64.9	15.2	5.2	79.6
1945–46	29.7	5.0	65.3	13.7	5.0	81.3
1910–1946	31.9	7.5	60.6	35.4	7.5	57.1

A condensation of Tables I and II, giving the distribution of total income by five year periods, is given in Table IV. This permits an easier comparison of the two methods, though much of the variability is covered up by the use of averages. For the whole period, labor received 61 percent of total income according to Method A and 57 percent by Method B. Method B results in rather variable estimates of the shares going to land and labor, with labor's share being particularly low in 1920–24 and 1930–34, and particularly high in 1940–44.

According to the results of Method A, labor has been receiving about two-thirds of the total agricultural income in recent years.

[15] It should be noted that if farm incomes remain at the 1946 level through 1948, long run agricultural income will not need to equal the figures indicated in the text. The present high levels of income over a three year period would make possible a net downward revaluation of the land by 10 to 20 percent from the 1946 values. This point applies, of course, only to existing owners.

During 1910–14 labor received about 58 percent of the total income, while from 1925–29 the percentage attributed to labor was approximately 62 percent.

Over the period the percentage share going to land has declined moderately. The percentage attributed to land was about 34 percent from 1910–14; approximately 31 percent during 1925–29 and 29 percent in the years 1935 to 1940. However, most of the lower percentage is explained by the two years 1937 and 1938.

Contrary to what one might expect, the percentage of the total income going to capital apparently has a downward trend. During the first few years of the period the return to capital (mostly machinery and livestock) was about 9 percent of the total. During the last 10 years of the period, the return hardly averaged 6 percent of the total. What this decline in proportion received indicates is difficult to say. The decline is in part the result of the lower interest rate used in the later years (6 percent from 1910 to 1934, 5.5 percent for 1935–36 and 5 percent since), but is also due to the absence of any significant increase in the value of capital assets employed by farmers.[16]

E. Method C

Method C assumes that we may appropriately use market returns to estimate labor returns in a manner similar to that used for land in Method A. The extension of the return for rented land to all land may be accepted with only moderate qualification, but the extension of a return to hired labor to all farm labor involves greater difficulties.

The first problem involved in such an estimate is the choice of the appropriate farm wage rate. The Department of Agriculture currently publishes four separate farm wage rates and a composite rate. Of the four rates the one theoretically comparable with the estimates of net labor return is the monthly wage without board. Since the net farm income figures include the value of home con-

[16] It is frequently overlooked that there has been almost no net investment in agriculture in the last 35 years. The investments made in tractors, trucks, and motor vehicles have been more than offset by the decline in investment in horses and mules. If 40 percent of the investment in automobiles is attributed to the farm, investment in motor vehicles increased from an average of $46,000,000 in 1910–14 to $1,202,000,000 in 1940, an increase of $1,156,000,000. The investment in horses and mules declined from an average of $2,811,000,000 to $1,256,000,000, a decrease of $1,546,000,000. The dollar investment in other machinery was almost identical—$1,430,000,000 and $1,431,000,000 in the two periods.

sumption and house rent, any wage rate which included perquisites would presumably be too low. Likewise a monthly rate is perhaps more suitable than a daily rate.

The first difficulty which the writer confronted was that the employment data on hired workers by regions used in calculating a national average wage would be different from the relative regional employments of all workers. In other words, the wage rate was weighted by regional hired employment weights, and since a larger proportion of all workers are hired workers in the regions with the highest wage rates, the actual weighting of the wage rates results in a higher wage rate than if all farm workers were used in calculating the weights. Reweighting the wage rates by total employment reduced the national rate by about 6 percent in recent years.[17]

The second difficulty was the lack of comparability between the estimates of labor income derived by using the monthly wage rate without board and that derived by using the total wage bill as used in the income and expense estimates of the Bureau of Agricultural Economics. When the total wage bill is divided by the average number of hired workers an estimate of hypothetical annual income per worker comparable to that obtained by multiplying a monthly rate by 12 should result. Actually there are marked absolute differences, and relative movements in time are not at all comparable.[18] The decision was made to use estimates of hired labor income calculated from the wage bill.[19]

[17] In calculations presented later, such reweighting was *not* undertaken.

[18] The discrepancies cannot be considered as insignificant. The following tabulation indicates the differences for three very stable periods. Monthly rates have been multiplied by 12.

	Calculated from wage bill	Monthly wage without board	Monthly wage with board	Composite monthly rate	Cash wages paid
		(In dollars)			
1910–14	271	350	265	297	190
1925–29	433	608	479	530	323
1935–39	361	410	312	349	281
		Index—1910–14=100			
1925–29	159	181	174	178	170
1935–39	133	118	117	118	148

[19] The reasons for the differences in the two series are discussed rather fully by E. W. Grove, *Income Parity for Agriculture, Part II—Expenses of Agriculture Production, Section 1, The Cost of Hired Farm Labor* (Washington: U.S.D.A. 1939), pp. 13–15. The writer personally believes that the wage bill estimates are too low and the wage rate estimates by crop correspondents too high, with the true wage returns lying somewhat nearer the wage bill estimates.

The third difficulty was the comparability of the estimates of the number of unpaid family workers and the number of hired workers employed in agriculture. Prior to 1935 estimates of the number of people employed in agriculture have been based largely on the Census of Occupations. Since it is more obvious what constitutes a hired farm worker than an unpaid family worker, the estimated number of hired workers may be more accurate than that of unpaid family workers. In addition, many workers doing the equivalent of as little as one or two days work in the week were included as unpaid family workers. This may result in the inclusion of many more "part-time" unpaid workers, such as school children, housewives, and farm operators with non-farm jobs than in the case of hired workers. Further, there was a significant discrepancy between the estimates of the number of unpaid family workers in the Agriculture and Occupation Censuses in 1940. The Census of Agriculture reported 7,941,000 family workers and the Population Census only 6,307,000, some 26 percent less. Much of the difference in estimates was due to the exclusion of a large number of female workers in the Population Census because of a failure to explicitly instruct enumerators with reference to work at chores. A later cooperative study by the Bureau of Census and Bureau of Agricultural Economics tends to substantiate the estimates derived from the Census of Agriculture, if two days or more of work per week is considered sufficient to classify as a full-time worker.[20]

It is perhaps safe to assume that except for periods similar to 1932–1934, the number of hired workers represent essentially full-time workers. However, one can be much less confident in making the same assumption about unpaid family workers. Even if family workers actually worked time equivalent to that of hired workers, the large numbers of young people, women and workers over 65 in the family worker category must reduce the labor effectiveness of the group.[21]

Though one may suspect the comparability of the two employment series, the present writer is not in any position to attempt the systematic analysis which is required. As a result, the BAE em-

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[20] Louis J. Ducoff and Gertrude Bancroft, "Experiment in the Measurement of Unpaid Family Labor in Agriculture," *Jl. of the Am. Stat. Assoc.*, XL (June, 1945), pp. 205–213.

[21] The age distribution of hired workers differs considerably from the family worker distribution, with a much smaller proportion of hired workers at either extreme of the distribution.

ployment estimates have been accepted for family workers as well as for hired workers. Table V shows the labor returns determined by assuming family workers receive the same income as hired workers, using the total wage bill as the basis for the estimate. The table also compares these results with those obtained from Method A.

TABLE V. COMPARISONS OF ESTIMATED LABOR RETURNS DERIVED FROM ASSUMPTIONS OF METHODS A AND C, 1910–1946

Year	Total labor return		Difference	Income per worker[3]	
	Method A[1]	Method C[2]		Method A	Method C
	(Millions of dollars)			(Dollars)	
1910	3,159	3,194	− 45	259	263
1911	2,586	3,191	−605	215	265
1912	3,022	3,298	−276	246	274
1913	3,052	3,357	−325	251	279
1914	3,137	3,312	−175	261	276
1915	2,882	3,331	−449	241	278
1916	3,185	3,665	−480	265	305
1917	5,631	4,527	1,104	478	384
1918	6,782	5,334	1,448	599	470
1919	6,854	6,042	812	617	544
1920	6,713	7,010	−297	591	617
1921	2,679	4,565	−1,886	235	400
1922	3,671	4,406	−735	322	385
1923	4,265	4,793	−528	377	421
1924	3,930	4,840	−910	345	426
1925	5,368	4,957	411	470	433
1926	5,271	5,052	219	457	438
1927	4,708	4,881	−173	418	434
1928	5,117	4,846	271	450	429
1929	5,191	4,854	337	460	430
1930	3,948	4,447	−499	353	398
1931	2,896	3,515	−619	260	315
1932	1,960	2,590	−630	177	234
1933	2,384	2,315	69	216	210
1934	2,619	2,778	−159	241	256
1935	3,976	3,395	581	356	305
1936	4,084	3,800	284	370	344
1937	4,882	4,302	580	448	395
1938	3,998	4,121	−123	371	382
1939	4,081	4,063	18	380	378
1940	4,083	4,213	−130	386	390
1941	5,893	5,056	847	577	473
1942	8,547	6,654	1,893	822	616
1943	10,770	8,570	2,200	1,049	803
1944	9,896	9,846	50	986	940
1945	9,981	10,681	700	1,014	1,085
1946	12,734	11,824	910	1,272	1,181

[1] See Table I.
[2] See Appendix Table IV.
[3] Determined by dividing columns 2 and 3 by estimated number of farm workers.

The years in which the differences are positive are years when farm operators and their families received less return per person than hired workers. This condition prevailed in 21 out of the 37 years. Only since 1935 have operator families rather consistently,

TABLE VI. ESTIMATED TOTAL INCOME PER FARM, DISTRIBUTION OF INCOME AMONG CAPITAL AND LAND AND LABOR PER FARM, AND LABOR RETURN TO FAMILY AND HIRED WORKERS PER WORKER, FOR COMMERCIAL FARMS, 1939–1946

Year	Total income per farm[1]	Capital and land income[2]	Labor income[3]	Labor income per family worker[4]	Labor income per hired worker[5]
			(in dollars)		
1939	1,850	655	1,195	615	395
1940	1,865	675	1,190	602	400
1941	2,625	910	1,715	930	515
1942	3,780	1,300	2,480	1,370	690
1943	4,685	1,555	3,130	1,725	875
1944	4,540	1,660	2,880	1,540	1,005
1945	4,600	1,695	2,905	1,645	1,095
1946	5,490	1,790	3,700	2,065	1,195

[1] For the period 3,130,000 commercial farms were assumed to receive 91 percent of total agricultural income. Estimates for 1939 calculated from L. J. Ducoff and M. J. Hagood, "Differentials in Productivity and in Farm Income of Agricultural Workers by Size of Enterprise and by Regions," U.S.D.A., August, 1944, Mimeo, p. 21 and unpublished data supplied by Mr. Ducoff.

[2] Capital and land income assumed to be the same proportion of farm income as derived from Method A for all farms for each year. This may result in a slight overestimate of capital and land income since these farms used about 85 per cent of total capital in 1939 while receiving 91 per cent of the income.

[3] Obtained by subtracting land and capital income from total income.

[4] Total number of family workers was assumed to be 4,665,000 for 1939. This was approximately 57 per cent of all family workers in 1939. In subsequent years the rate of change in family workers on commercial farms was assumed to be one-third of the change in all family workers. Estimate for 1939 was taken from L. G. Ducoff, *Wages of Agricultural Labor in the United States*, USDA, Tech. Bull. No. 895, July, 1945, p. 10.

[5] Total number of hired workers was assumed to be 2,235,000 in 1939. This was approximately 86 per cent of all hired workers in that year. In subsequent years the number of hired workers was assumed to change at one-half the rate of the number of all hired workers. It was assumed that commercial farmers paid 90 per cent of the total wage bill in 1939 and 1940, 91 per cent in 1941 and 1942, 93 per cent in 1943, and 94 percent in 1944, and 95 percent in 1945 and 1946.

had a labor return more favorable than hired workers. However, even during this period the difference was of a very small magnitude, except for the war years.[22]

[22] See below, Section II, for an interpretation of these results.

II. Income of Commercial Farmers

Our previous calculations have shown that operators and unpaid family workers have received a labor return no larger than that of hired workers.[23] This particular result forces attention on the effect of including 3,000,000 very small and unproductive farms in our estimates of agricultural income. The comparative labor returns of hired workers and family workers do not indicate that those operators hiring labor receive a labor income no larger than paid to hired workers. The low earnings of family workers compared with hired workers is obtained because of the inclusion of a large number of subsistence, part-time, and resident farms in the total.[24]

TABLE VII. TOTAL INCOME PER FARM AND LABOR INCOME PER WORKER, ALL FARMS AND COMMERCIAL FARMS, 1939–1946
(in dollars)

Year	Total income per farm		Labor income per worker	
	All[1,4]	Commercial[2]	All[1,4]	Commercial[3]
1939	1,020	1,850	380	545
1940	1,050	1,865	386	545
1941	1,485	2,625	577	795
1942	2,160	3,780	822	1,150
1943	2,725	4,685	1,049	1,455
1944	2,660	4,540	986	1,375
1945	2,700	4,600	1,014	1,425
1946	3,225	5,490	1,272	1,795

[1] 1939–1943 calculated from BAE, "Net Farm Income and Parity Summary: 1943," pp. 8 and 12. 1944–1946 from *The Farm Income Situation*, June–July, 1947, pp. 22 and 24.

[2] From Table VI, Method A.

[3] Calculated from Table VI.

[4] These columns do not represent the income of the non-commercial farms but all farms including commercial farms. Income of non-commercial farmers are much less. In 1946, for example, the labor income on non-commercial farms was of the magnitude of $300 to $350.

[23] This statement assumes that actual hired workers had the same length of employment each year as operators and unpaid family laborers. Hired workers were undoubtedly at work a much smaller proportion of the time. Consequently the statement as it stands is true of actual workers only if each group of workers had the same amount of employment.

[24] In 1939 farms that had a total value of products sold, traded or used in the home of less than $599 accounted for 42.5 percent of the total number of family workers and only 13.9 percent of the hired workers. Farms with a total value of $4,000 to $9,000 had 4.7 percent of the family workers and 18.0 percent of the hired workers, while farms with a total value of production excess of $10,000 employed 17.6 percent of all hired labor and involved only 0.9 percent of the family labor. (See L. J. Ducoff, *Wages of Agricultural Labor in the United States*, U.S.D.A.,

An attempt has been made to carry through the particular assumptions of Method A for the commercial sector of American agriculture. The results are presented without any pretensions of having achieved a high degree of accuracy, but in the belief that some little light is thrown on a significant issue usually ignored in agricultural income data. Commercial farms have been defined to include all farms selling, trading, or using more than $600 worth of products in 1939. There is no particular merit in the lower limit chosen except that it is commonly used and results in the inclusion of about half of all farms.

On the commercial farms, operators and other family workers apparently received a labor return almost twice that of hired labor. (See Table VI.) The war period, of course, has resulted in a very marked improvement in the position of all farm workers.

A comparison may be made between the incomes on commercial farms and all farms. Table VII shows the total income produced per farm and the labor income per worker. There is a greater difference in total income per farm than in labor income because the commercial farms, while comprising 50 to 55 percent of all farms, use approximately 65 percent of all labor. Labor returns tend to be approximately a third higher on the commercial farms than on all farms.

Much might be said for a revision of our agricultural income data to provide a separate series for commercial farms defined in some reasonable manner. In terms of public policy these farms present very different problems than those of the various categories of smaller farms. Current income data are of little help in determining the income position of the farms that produce the great bulk of the agricultural output. Furthermore, the wholly inadequate income position of many other farm groups tends to be covered up during periods similar to the present by the significant income strides made by the commercial farmers.

III. Allocation of Gross Agricultural Income

The allocation of gross agricultural income made below is essentially mechanical, accepting as valid the estimated division of

Technical Bulletin No. 895, July, p. 10.) It has been estimated that more than 20 percent of all farms may be classed as part-time or residential farms. Another 20 percent, not falling in either of the above two categories, has a total value of product of less than $600. (See T. W. Schultz, *Agriculture in an Unstable Economy*, New York: McGraw-Hill Book Co. 1945, p. 199). Because of the methods used in defining employment in agriculture, the essentially non-commercial sector of American agriculture is given a disproportionate weight in the employment aggregates.

gross income into production costs and net income as calculated by the Bureau of Agricultural Economics. Production costs are here interpreted to cover three types of costs: (1) Products or services purchased from non-agricultural industries for use in current production, (2) property taxes, and (3) depreciation or maintenance. We have excluded livestock and feed purchased as a production cost on the assumption that such purchases represent transfers solely within American agriculture. Two modest errors are involved in making this assumption. First, some feed and feeder livestock are imported. Second, even on domestic feed and livestock

TABLE VIII. ALLOCATION OF GROSS AGRICULTURAL INCOME[1]
(in percent)

	1910–14	1915–19	1920–24	1925–29	1930–34	1935–39	1940–44	1945–46
Products and services purchased[2]	12.2	11.6	16.1	15.6	19.6	16.3	13.6	12.9
Taxes	3.2	2.9	5.2	5.1	6.8	4.7	2.9	2.5
Depreciation[3]	10.3	9.1	12.6	10.2	12.8	10.5	8.9	9.3
Net income	74.3	76.3	66.1	69.1	60.8	68.5	74.6	75.3
Land	24.4	27.7	21.9	21.4	17.6	18.9	22.2	22.4
Capital	6.5	5.9	5.9	4.8	6.0	4.1	3.7	3.8
Labor	43.5	42.7	39.5	42.8	37.3	43.6	48.7	49.1

[1] Gross agricultural income is cash income from marketings adjusted for changes in inventory, value of home consumed products, rental value of homes nad government payments minus the value of livestock and feed purchased.

[2] Includes all products and services purchased from non-farmers for use in current production. Excludes livestock and feed purchased.

[3] The depreciation item may or may not be equal to actual expenditures on buildings, machinery and motor vehicles. During the following periods net investment occurred: 1910–14, 1915–19, 1925–29, 1935–39, and 1940–44, while in the other two periods actual disinvestment occurred. Depreciation does not include the cost of maintaining soil fertility.

purchases a part of the purchase price represents payments to non-agricultural industries. Such payments would include transportation, commissions, and services of feed processing industries.

The estimated percentage distribution of gross agricultural income is given in Table VIII for five year periods from 1910 through 1944 and for 1945–46. Net income reached an average low of 60.8 percent of gross income during 1930–34 and an average high of 76.3 percent in 1915–19.[25] The high was closely approached by experi-

[25] The year 1932 represented the minimum proportion of net income to gross income of 57.1 percent, while the year 1943 showed the highest proportion of gross income attributable to net income, namely 78.1 percent. In 1918 net income was 77.9 percent of gross income, the second highest proportion, while 1921 showed the second lowest proportion, 58.8 percent.

ence during 1940–44. During the inter-war period taxes accounted for a considerably larger proportion of gross income than before World War I. Products and services purchased also increased, but not to the same extent as taxes. Depreciation apparently did not have a trend during the period, being approximately the same in 1910–14, 1925–29, and 1935–39, and showing similar relationships in each of the two war periods and in each of the two depression periods.

The net income items, land, capital, and labor, show about the same relative relationships to gross income as they did to net income. Land has apparently received a smaller proportion of the gross product in recent years, while capital has shown a fairly marked decrease. If 1940–44 is excluded, labor has apparently about held its own. One might hazard the guess that if national income remains high and employment opportunities exist, the proportion of the gross income going to labor should exceed the proportion existing from 1935–39 (43.6 percent), but will probably not be as large as during 1940–44 (48.7 percent).

IV. Summary

How closely the estimates of functional distribution of income approximate the actual distribution depends upon the accuracy of the basic data and the validity of the assumptions made. As a first approximation the estimated distribution derived by estimating land returns from rents paid, capital returns from current valuation of inventories, and labor returns as a residual seems to be of reasonable accuracy. The major limitation lies in the treatment of capital. There is no reliable series of data on short term interest rates or amounts paid by farmers, and not all capital items are included, though the errors involved are unlikely to appreciably affect the estimated returns to land or labor.

However, given the limitations of the present estimates, it is possible to argue that attempts to obtain a functional distribution of income in agriculture is one of the necessary forward steps in the use of income data in policy formulation and economic analysis. Present types of agricultural income data are quite unsatisfactory for determining the nature or extent of resource and welfare problems in agriculture.

This is not to argue that the estimates made above, or improved modifications of them, are adequate. Much more needs to be done.

An ambitious program of income estimates might well include the following in addition to the series now available:

I. Annual estimates of income for the following classification of farms
   A. Family type farms
      1. High production
      2. Moderate production
      3. Low production
      4. Part-time
      5. Resident
   B. Non-family types
II. Annual estimates of functional distribution of income for each of the above categories of farms
III. Annual estimates of non-agricultural income, by sources (labor and capital), for each category of farms
IV. Annual estimates of personal (family) distribution of income from all agricultural and non-agricultural sources
V. Estimates of the differences in money incomes required to obtain equivalent standards of living in different agricultural regions and in different sizes of cities by regions.

The above is an ambitious program, yet such a program seems necessary if income data are to be utilized in economic analysis and policy formulation in any except the very crudest fashion. Income data should be useful in answering two broad questions: (1) Are agricultural resources being utilized with maximum efficiency? (2) Are farm families receiving incomes sufficient to provide a socially accepted minimum scale of living? Neither of the two questions can be answered from income data alone, but adequate income data are required for answering both.

An important part of the problem raised by the first question is the general equivalence of returns to resources in agriculture and in other sectors of the economy. Whether such general equivalence exists can be determined only by having information on the monetary returns, including their distribution, and a fairly accurate indication of the evaluation of the money incomes in real terms.

Such an analysis does not, of course, provide conclusive evidence on whether or not maximum efficiency in resource use has been achieved. Further analysis is required to determine if the income paid or attributed to a resource is equal to the value of the marginal

product of the resources. In other words, we need to know not only if the income received by comparable resources are equivalent in different employments, but whether or not the incomes are equal to the value of the marginal products in the respective employments. If the resource incomes or prices are not equal to the value of the respective marginal products, resource efficiency can be improved by rearranging resources to bring about such equality.[26]

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[26] While the article was in press data became available permitting estimates for 1947. Such estimates were inserted in the appendix tables, but no changes were made in the text or text tables. Some of the estimates are given here. Total net income from agricultural and government payments was $21,143,000,000. According to Method A (Table I) the percentage allocation of income was 29.4 percent to land, 5.0 percent to capital, and 65.6 percent to labor. Income allocation according to Method B (Table II) indicates 12.8 percent to land, 5.0 percent to capital, and 82.2 percent to labor. The rate of return on rented land (Table III) was 10.6 percent. Total labor returns as a residual as calculated by Method A was $13,865,000,000, while labor returns derived from wages paid hired labor was $12,656,000,000. This gives a positive difference of $1,209,000,000 or a difference of $119 per worker (Table V). Income estimates for commercial farmers are as follows: (Table VI) income per farm, $6,150; capital and land income per farm, $2,115; labor income per farm, $4,035; labor income per family worker, $2,210, and labor income per hired worker, $1,305. Labor income per worker on all farms was $1,362 (calculated according to Method A) and $1,930 on the commercial farms.

APPENDIX

TABLE I. NET RENT TO ALL LANDLORDS, ESTIMATED PROPORTION OF TOTAL LAND RENTED, AND ESTIMATED TOTAL NET RENT ON ALL FARM LAND, 1910–1945

Year	Net rental to all landlords[1] (millions of dollars)	Proportion of all land rented[2]	Estimated total net rent (millions of dollars)
1910	612	36.9	1,659
1911	640	37.3	1,716
1912	667	37.8	1,765
1913	669	38.2	1,767
1914	696	38.7	1,822
1915	789	39.1	2,018
1916	1,012	39.6	2,556
1917	1,488	40.1	3,711
1918	1,570	40.5	3,877
1919	1,684	40.9	4,117
1920	1,046	40.9	2,557
1921	776	40.9	1,897
1922	906	40.9	2,215
1923	1,025	40.9	2,506
1924	1,161	40.9	2,839
1925	1,079	41.0	2,632
1926	999	41.0	2,437
1927	1,131	41.0	2,758
1928	1,092	41.0	2,663
1929	1,062	41.0	2,590
1930	810	40.7	1,990
1931	492	40.3	1,221
1932	343	40.0	858
1933	479	39.7	1,207
1934	622	39.4	1,529
1935	727	39.2	1,854
1936	788	39.5	1,995
1937	760	39.5	1,924
1938	672	39.6	1,696
1939	734	39.6	1,854
1940	754	39.6	1,904
1941	1,045	38.8	2,693
1942	1,485	38.3	3,877
1943	1,728	37.8	4,571
1944	1,864	38.1	4,892
1945	1,858	37.3	4,981
1946	1,952	37.1	5,261
1947	2,300	37.0	6,216

[1] *Agricultural Statistics, 1943*, p. 412, *Agricultural Statistics, 1946*, p. 572 and *The Farm Income Situation*, June-July, 1947, p. 22, 1946 estimated by writer. Includes government payments accruing to landlords.

[2] Based on Census data for 1910–1934. See *Sixteenth Census of the United States, 1940, Agriculture*, Vol. III, *General Report*, p. 154 and 159; 1935–1946 supplied by Mr. M. M. Regan of the Bureau of Agricultural Economics.

TABLE II. VALUE OF FARM LAND AND BUILDINGS, AVERAGE FARM MORTGAGE INTEREST RATE, AND ESTIMATED INTEREST COST

Year	Value of farm land and buildings (millions of dollars)[1]	Farm mortgage interest rate (per cent)[2]	Estimated interest cost (millions of dollars)
1910	34,801	6.0	2,088
1911	36,050	6.0	2,163
1912	37,306	6.1	2,276
1913	38,463	6.1	2,346
1914	39,586	6.1	2,415
1915	39,597	6.1	2,415
1916	42,271	6.2	2,621
1917	45,495	6.1	2,775
1918	49,987	6.1	3,049
1919	54,539	6.1	3,327
1920	66,316	6.1	4,045
1921	61,476	6.2	3,812
1922	54,017	6.3	3,403
1923	52,710	6.4	3,373
1924	50,468	6.3	3,179
1925	49,648	6.3	3,116
1926	49,052	6.2	3,041
1927	47,634	6.1	2,906
1928	47,495	6.1	2,897
1929	47,880	6.0	2,873
1930	47,880	6.0	2,873
1931	43,993	6.0	2,640
1932	37,236	6.0	2,234
1933	30,724	6.0	1,843
1934	31,933	5.8	1,852
1935	32,859	5.5	1,807
1936	33,910	5.1	1,729
1937	34,757	4.9	1,703
1938	34,747	4.7	1,633
1939	33,931	4.6	1,561
1940	33,642	4.6	1,548
1941	33,497	4.5	1,507
1942	35,331	4.5	1,590
1943	37,855	4.5	1,703
1944	42,532	4.5	1,914
1945	46,389	4.8	2,227
1946	52,114	4.8	2,501
1947	58,604	4.6	2,696

[1] As of January first for each year, BAE, "Net Farm Income and Parity Report: 1943," (Washington: United States Department of Agriculture, July, 1944), p. 29 (mimeo.) and BAE, *Farm Income Situation*, June, 1945, p. 28.

[2] 1910–1928—*Agricultural Statistics, 1941*, p. 596; 1929 to date—*Agricultural Statistics, 1944*, p. 456.

TABLE III. VALUE OF NON-REAL ESTATE FARM PROPERTY, ESTIMATED INTEREST RATE, AND ESTIMATED INTEREST CHARGE ON NON-REAL ESTATE CAPITAL, 1910–1946

Year	Value of Non-real estate farm property[1] (millions of dollars)	Estimated interest rate (per cent)	Interest charge (millions of dollars)
1910	7,160	6.0	430
1911	7,519	6.0	451
1912	7,331	6.0	440
1913	8,015	6.0	481
1914	8,589	6.0	515
1915	8,872	6.0	532
1916	9,108	6.0	546
1917	10,047	6.0	603
1918	12,676	6.0	761
1919	13,966	6.0	838
1920	14,011	6.0	841
1921	11,585	6.0	695
1922	9,035	6.0	542
1923	8,672	6.0	520
1924	8,857	6.0	531
1925	8,841	6.0	530
1926	9,296	6.0	538
1927	9,338	6.0	560
1928	9,912	6.0	595
1929	10,586	6.0	635
1930	10,498	6.0	630
1931	8,382	6.0	503
1932	6,647	6.0	399
1933	5,554	6.0	333
1934	5,685	6.0	341
1935	5,879	5.5	319
1936	7,782	5.5	428
1937	7,951	5.5	436
1938	8,328	5.0	416
1939	8,407	5.0	420
1940	8,468	5.0	423
1941	8,844	5.0	442
1942	11,528	5.0	576
1943	15,470	5.0	777
1944	16,465	5.0	823
1945	17,094	5.0	855
1946	17,887	5.0	894
1947	21,245	5.0	1,062

[1] BAE, "Net Farm Income and Parity Report: 1943," p. 29 and *The Farm Income Situation*, June-July, 1947, p. 28.

TABLE IV. NUMBER OF HIRED WORKERS, TOTAL EXPENSES FOR HIRED LABOR, AVERAGE EXPENSE PER WORKER, TOTAL FARM EMPLOYMENT AND ESTIMATED TOTAL LABOR RETURN ACCORDING TO METHOD C, 1910–1946

Year	Number of hired workers[1] (thousands)	Expenses for hired labor[2] (mil. of dol.)	Average per worker per year (dollars)	Average farm employment[1] (thousands)	Estimated total labor (mil. of dol.)
1910	2,877	757	263	12,146	3,194
1911	2,870	760	265	12,042	3,191
1912	2,889	792	274	12,038	3,298
1913	2,905	807	279	12,033	3,357
1914	2,919	805	276	12,000	3,312
1915	2,934	815	278	11,981	3,331
1916	2,966	904	305	12,016	3,665
1917	2,933	1,127	384	11,789	4,527
1918	2,841	1,335	470	11,348	5,334
1919	2,784	1,515	544	11,106	6,042
1920	2,883	1,780	617	11,362	7,010
1921	2,901	1,159	400	11,412	4,565
1922	2,915	1,122	385	11,443	4,406
1923	2,894	1,219	421	11,385	4,792
1924	2,874	1,224	426	11,362	4,840
1925	2,871	1,243	433	11,448	4,957
1926	3,027	1,326	438	11,534	5,052
1927	2,950	1,280	434	11,246	4,881
1928	2,956	1,268	429	11,296	4,846
1929	2,984	1,285	430	11,289	4,854
1930	2,850	1,134	398	11,173	4,447
1931	2,690	847	315	11,159	3,515
1932	2,498	884	234	11,069	2,590
1933	2,433	512	210	11,023	2,315
1934	2,346	601	256	10,852	2,778
1935	2,489	740	305	11,131	3,395
1936	2,561	880	344	11,047	3,800
1937	2,631	1,039	395	10,892	4,302
1938	2,620	1,000	382	10,789	4,121
1939	2,595	982	378	10,740	4,063
1940	2,566	1,020	398	10,585	4,213
1941	2,532	1,238	488	10,361	5,056
1942	2,542	1,626	640	10,397	6,654
1943	2,406	2,009	835	10,263	8,570
1944	2,227	2,184	981	10,037	9,846
1945	2,118	2,299	1,085	9,844	10,681
1946	2,148	2,536	1,181	10,012	11,824
1947	2,227	2,776	1,246	10,157	12,656

[1] BAE, "Farm Wages, Farm Employment and Related Data," (Washington: USDA, 1943), p. 155, and BAE, *Farm Labor*, September 12, 1947, p. 6.

[2] BAE, "Net Farm Income and Parity Report: 1943," p. 26 and *Farm Income Situation*, June-July, p. 26.

NOTES

SOME PROBLEMS IN DEFLATING FARMERS' DEBT PAYING PERFORMANCES

THE problems dealt with here were encountered in a study of the repayment performance of 121 tenant-purchase borrowers in six Wisconsin counties.[1] Since much of the performance record (1938 through 1945) was in a period of very favorable farm income it was desired to deflate the performance to obtain a more normal picture.

The procedure used in calculating "normal" ability to pay on Farm Ownership loans was to deflate by dividing each year's costs by a 1935–39 cost index and each year's income by a 1935–39 price index and subtracting deflated costs from deflated incomes.[2] Costs included family living and farm operating costs, net debt payment (exclusive of Farm Ownership payments), and capital expenditures.[3] Income was simply gross cash income.

In actual repayment record only one of the 121 borrowers was even slightly behind his amortization schedule. Most were far ahead of schedule and several had fully retired their loans in from two to eight years. But with prices Wisconsin farmers received and paid deflated to the 1935–39 average, only 16.6 percent could have paid as much or more than fell due in the same period.

If this were the last word the picture would be dark indeed for the prospect of paying for a farm out of earnings on it. But there were indications that this deflation of farmers' incomes and expenses was misleading as an indicator of farmers' potential repayment rates under normal (1935–39) price conditions. The most telling evidence that the deflating process had distorted the picture

[1] W. K. Burkett, *Acquiring Farm Ownership by 100 Percent Loans*, Ph.D. thesis, University of Wisconsin Library, Madison, 1948.

[2] The source of the indexes was the *Wisconsin Crop and Livestock Reporter*, Federal-State Crop Reporting Service, June 1947, page 5. The series averaged to apply to expenses was "Retail prices paid by Wisconsin farmers for commodities used in production and family maintenance."

[3] The decision to deflate net debt payment was made on the basis that most of the debts were incurred as operating or capital expense after the 1935–39 period and many of them during the year previous to their repayment. This treatment of debt payment, of course, tends to exaggerate somewhat the borrower's ability to pay. However, it seems likely that any error in this direction is more than offset by probable inventory increases which are not included in income.

came from the trend of deflated funds available for Farm Ownership payment for borrowers having records back to 1940. In 1940 the price and cost indexes were 95 and 98 percent, respectively, of the 1935–39 average. Thus, as far as prices and costs were concerned, the borrowers' ability to pay in 1940 should have been very close to (just a little below) normal. Table 1 shows the average annual deflated funds available for Farm Ownership payment for eight cases in Grant County and four cases in Langlade County which had records from 1940 to 1945. The striking thing is that, whereas there was a positive sum in nearly normal 1940, as prices went up the general trend of deflated funds available for repayment declined sharply into negative figures.

TABLE 1. TREND OF DEFLATED FUNDS AVAILABLE FOR FARM OWNERSHIP PAYMENTS, 1940–1945

Year	1940 Dollars	1941 Dollars	1942 Dollars	1943 Dollars	1944 Dollars	1945 Dollars
Average of 8 cases in Grant County	755	53	−266	−898	−287	−777
Average of 4 cases in Langlade County	86	−294	− 47	−620	−536	−638

The data showed that as prices rose, the borrowers had higher gross incomes, higher farm operating costs, higher family living costs, spent more on capital items and non-Farm Ownership debt repayment, and still greatly increased their Farm Ownership payments. The process of deflating income and outlay to find repayment ability under normal conditions assumes that the physical relationships did not change significantly as prices went up; it assumes that the observed dollar increases were value changes, not quantity changes. Table 1 suggests that, if the price and cost indexes are accurate, there were in fact important quantity changes.

If the price indexes used really reflect the changes in farmers' prices and costs relative to 1935–39, then the deflated income and cost changes from year to year represent proportionate changes in the quantity of things sold and things paid for. It follows that the factors accounting for the apparent decline in deflated ability to pay from 1940 to 1945 can be sorted out and their relative importance indicated.

1. *Operating Disequilibrium with 1935–39 Prices and 1940–45 Production*

In 1940 price and cost indexes were nearly the same as the average for the preceding five years which is the base. This being the case, it would be expected that farmers had attained approximate equilibrium by 1940—that they had adjusted input and output to prices as well as they were able and that net cash operating income (gross cash income minus cash farm operating costs) was maximized. Now, since deflating puts subsequent years on the same price basis as 1940, any failure of subsequent years' deflated net cash operating income to reach that of 1940 means input and output are not in optimum adjustment.[4] Table 2 shows the amounts by which deflated net cash operating income actually did fall below 1940 in subsequent years. For the eight cases from Grant County and the four from Langlade the apparent operating loss due to disequilibrium is considerable and, in general, increases with the higher price years. Why does Grant County show a gain in 1941

TABLE 2. APPARENT LOSSES ACCOUNTED FOR BY OPERATING DISEQUILIBRIUM
(Changes in net cash operating income, measured from 1940, when 1935–39 indexes are applied to 1940–45 incomes and expenditures)[a]

Year	1940 (1940 operating income in dollars)	1941	1942	1943	1944	1945
		(Changes from 1940 operating income in dollars)				
Grant County						
Average of 8 cases to 1945	2,573	+383	− 91	−824	−580	−551
Average of 6 cases to 1943	2,339	+277	+201	+ 3		
Langlade County						
Average of 4 cases to 1945	1,621	−178	−575	−746	−630	−827

[a] "+" sign means that year's net cash operating income exceeded 1940's, while "−" means that year's was below 1940's by the figure associated with the sign.

over 1940 before the decline sets in? A probable explanation is that, as farmers on farms relatively new to them, the borrowers were operating on a higher real cost curve and at a lower output in 1940 than in 1941.

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[4] The 1940 figure is "reflated" or adjusted because its indexes were slightly below normal, 95 for prices and 98 for costs. It is considered that these figures are close enough to 100 so that input and output have not been disturbed—that there is approximate equilibrium at 1935–39 prices and 1940 quantities.

What was the nature of the disequilibrium causing these apparent losses relative to 1940? Table 3 shows that the 1935–39 dollar value or physical quantity of both input and output increased when prices went up. Due to the more rapid increase in prices than in costs it was profitable to gain increased output even at the cost of a greater percentage increase of real input.[5] When prices were

TABLE 3. TRENDS IN OUTPUT AND INPUT

A. Trends in Output (deflated gross cash income)

Year	1940	1941	1942	1943	1944	1945
Grant County						
Average of 8 cases to 1945						
Value in 1935–39 dollars	3,796	4,699	4,476	4,306	4,307	4,432
Volume in percentages	100%	124%	118%	113%	113%	117%
Average of 6 cases to 1943						
Value in 1935–39 dollars	3,810	4,513	4,735	5,035		
Volume in percentages	100%	118%	124%	132%		
Langlade County						
Average of 4 cases to 1945						
Value in 1935–39 dollars	2,778	2,862	2,689	3,081	3,649	3,951
Volume in percentages	100%	103%	97%	111%	131%	142%

B. Trends in Input (deflated farm operating costs)

Grant County						
Average of 8 cases to 1945						
Value in 1935–39 dollars	1,273	1,730	1,988	2,557	2,325	2,497
Volume in percentages	100%	136%	156%	201%	183%	196%
Average of 6 cases to 1943						
Value in 1935–39 dollars	1,471	1,937	2,195	2,693		
Volume in percentages	100%	132%	149%	183%		
Langlade County						
Average of 4 cases to 1945						
Value in 1935–39 dollars	1,363	1,449	1,667	2,206	2,656	3,159
Volume in percentages	100%	106%	122%	162%	195%	232%

deflated to 1935–39 levels it, in effect, left the borrowers hanging up at an uneconomical level of production; their production was out of equilibrium for 1935–39 prices.[6]

2. *Increased Level of Family Living*

Subtracting 1940 adjusted living costs from the deflated living

[5] As an example, it is known that Wisconsin farmers greatly increased their use of fertilizers during the war.

[6] There is one feature of the data which casts some doubt on the disequilibrium explanation of the apparent operating losses (and incidentally on the increased real living and investment explanations below). The eight Grant County cases with 1940 to 1945 records did not show a steady increase in production (deflated gross cash income) as did the other two groups. If deflated operating expense represents input, why did this group continue to increase input but not output? Some possible explanations are: (1) The family working force declined. (2) The farmers became less careful about holding down costs and keeping up production as incomes improved. (These eight farmers' average potential repayment rate was 227 as compared with 425 for the six whose record covered 1940–43.)

A possible alternative to the disequilibrium explanation is that the price and cost indexes do not conform to the actual price and cost changes. It is hypothetically possible that the farmers' inputs and outputs remained practically constant and that the apparent increases were due to indexes being too small. However, this alternative does not seem to account for the peculiar production performance of the eight farmers any better than the disequilibrium theory.

costs of subsequent years gives the increase in family living in terms of 1935–39 dollars. Real living costs increased very considerably on the average for the eight Grant County borrowers—nearly 50 percent over 1940 in some years. The six Grant County borrowers who retired their loans soon after 1943 increased their real living costs only moderately. The Langlade group actually had an average decrease the first two years and later a very modest increase.

3. *Increased Investment and Debt Payment*

When the 1940 adjusted capital and debt outlay is subtracted from the deflated capital and debt outlay of subsequent years, the result is the real increase in investment and debt payment for the subsequent years. This increase averaged 60 percent a year over 1940 for the eight borrowers in Grant County who had records from 1940 to 1945. The four cases in Langlade County, on the other hand, spent less by an annual average of 15 percent from 1942 to 1945 than they did in 1940.

4. *Summary of Apparent Losses and Adjustments Toward Normal Ability to Pay*

The apparent losses can now be summarized to show how they account for the difference between adjusted funds available for Farm Ownership payment in 1940 and the deflated funds available for payment in later years.[7] Table 4 shows for the eight Grant County cases having records to 1945 how the three apparent losses described make up the difference between the 1940 adjusted income available for Farm Ownership payments and the largely negative figures for the subsequent years. These data also enable some adjustments of the 1940 figure to make it a more probable "normal." In Table 4 there is a negative 383 for 1941 disequilibrium operating loss. That means the 1941 net operating income was $383 above the 1940 figure. Since the 1941 figure is a product of 1935–39 prices and costs times 1941 output and input, 1941 operations can be taken as more nearly equilibrium in this case than 1940's. Then $383 may be added to $755, giving $1,138 as the normal funds available for Farm Ownership payment if capital and debt expenditures remain

[7] As explained earlier the 1940 figure was adjusted or inflated because its indexes, 95 for prices and 98 for costs, were below the base. Equilibrium is assumed to be approximated at 1935–39 prices and 1940 production.

TABLE 4. SUMMARY ACCOUNT OF APPARENT LOSSES AND CORRECTIONS TOWARD NORMAL REPAYMENT ABILITY

Grant County, 8 cases 1940–45

Year	1940	1941	1942	1943	1944	1945
Deflated funds available for F.O.[a]	$755	53	−266	−898	−287	−777
Plus disequilibrium operating loss	—	−383	91	824	580	551
Plus increase in standard of living	—	191	407	426	305	393
Plus increase in capital and debt outlay	—	894	523	403	157	588
Funds available for F.O. at 1935–39 prices and 1940 production	$755	755	755	755	755	755
Add 1941 increase in net income	$383					
Funds for F.O. if capital and debt expenditures remained at 1940 level	$1138					
Subtract average increase in capital and debt expenditures	513					
"Normal" amount available for F.O.	$625					
Average F.O. amortization	440					
Normal margin over F.O.	$185					

[a] F.O. = Farm Ownership payment.

the same as in 1940. But capital and debt expenditures show an average annual increase of $513 which, subtracted from $1,138, leaves $625 as the most probable normal amount available for Farm Ownership payment. The average amortization to be paid is $440, leaving a normal annual surplus of $185 after Farm Ownership payments. The same procedure leaves an average normal surplus of $306 for the six Grant County borrowers who completed repayment in 1943. The four Langlade borrowers are not so fortunate. They lack $98 of having enough for their average amortization of $299.

The borrowers whose records ran back to 1940 are only 18 of the 121 included in the entire study. The above procedure cannot be applied directly to the 103 borrowers whose records began after 1940. However, the assumption that the deflation process had brought the same errors for other borrowers in similar counties and the application of year by year corrections permitted at least a rough estimate of the number of borrowers who could have met their repayment schedules had 1935–39 prices continued.[8] With the simple deflation process only 16.6 percent of the borrowers had appeared able to meet their amortization schedules. After the corrections approximately 94 percent appeared able to meet them.

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[8] For details see Burkett, op cit., pp. 193–205.

A METHOD OF PREDICTING NUMBERS OF HENS AND PULLETS ON INDIANA FARMS JANUARY 1

WHAT factors do Indiana farmers consider when deciding upon the number of hens and pullets they will keep? When do they make their plans? Can a formula be constructed for predicting annual changes in numbers of hens and pullets? These are the questions which the study here reported upon attempted to answer.

Data on the number of chicks hatched in Indiana are of little value as a measure of the number of hens and pullets for the following year. Some of the larger hatcheries ship many of their chicks outside the State. Broiler operations in the State and variation in the rate of culling also disturb the relationship between chicks hatched and numbers of hens and pullets on farms. Consequently, more refined methods of estimation are needed.

Factors Affecting Changes in Numbers of Hens and Pullets on Indiana Farms January 1

The relative price of feed in the United States and the prices of eggs and poultry meat in Indiana were the chief factors affecting numbers of hens and pullets on Indiana farms in January.[1] When the relative price of feed[2] increased 10 percent from one year to the next, the number of hens and pullets on Indiana farms decreased about 2 percent. When the price of eggs rose 10 percent the number of hens and pullets increased 1 percent. When the price of poultry meat rose 10 percent, the number of hens and pullets increased about one-half of 1 percent.[3] These relationships are shown in Table 1.

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[1] Data were obtained from published figures usually available at offices of State Agricultural Statisticians or from the USDA. The 20-year period 1927–46 was used for calculations. Multiple linear correlation was used.

[2] The price of poultry ration in the United States relative to an index of prices received by Indiana farmers for all farm products, 1935–39=100. The United States poultry ration was used in preference to the Indiana ration because the Indiana ration was not available throughout the period. The two are quite similar.

[3] Efforts were made to use relative prices of poultry and eggs rather than actual prices, but results were not so significant as when actual prices were used. To recheck results an effort was made to explain changes in numbers of hens and pullets for the entire United States. Here also the *actual* prices of poultry and eggs explained changes in numbers better than did the relative prices while the *relative* price of feed did better than the *actual* price. Whatever the reasons, it appears that numbers of hens and pullets both in Indiana and in the United States respond to *relative* prices of feed and *actual* prices of poultry and eggs.

TABLE 1. EFFECT OF 10 PERCENT INCREASE IN VARIOUS FACTORS ON NUMBERS OF HENS AND PULLETS ON INDIANA FARMS JANUARY 1, 1927 TO 1946

10 percent increase in	Net change[1] in number of hens and pullets[2]
	Percent
Price of feed[3]	−2.2
Price of eggs	+0.9
Price of poultry meat	+0.4

[1] Effect of the factor measured after the effects of the other two factors have been eliminated.

[2] Change in price (Dec.-Jan.-Feb. 1926) to (Dec.-Jan.-Feb. 1927) related to change in numbers January 1927 to January 1928.

[3] Price of poultry ration in the United States relative to prices received by Indiana farmers for all farm products.

These three factors together explained about 80 percent of the variation in numbers of hens and pullets on hand January 1. Thus the method here described accounted for four-fifths of the variation in numbers of hens and pullets on Indiana farms. The method made possible a rather accurate prediction of the number of hens and pullets on Indiana farms about 10 months in advance.

Of the three factors, the price of feed was most important (table 2).

TABLE 2. RELATIVE IMPORTANCE OF VARIOUS FACTORS AFFECTING CHANGES IN NUMBER OF HENS AND PULLETS ON INDIANA FARMS JANUARY 1, 1927 TO JANUARY 1, 1946

Factors	Net variation in number of hens and pullets on Indiana farms January 1 explained by each factor[1]
	Percent
Price of feed[2]	50
Price of eggs	25
Price of poultry meat	5

[1] After eliminating the effect of the other two factors.

[2] Price of poultry ration in United States relative to prices received by Indiana farmers for all farm products.

Efforts were made to determine whether the number of hens and pullets responded to factors other than prices of feed, eggs, and poultry. The following series were tested and found not significant in their gross relationships to numbers of hens and pullets:

1. Various measures of prices and income frequently referred to as measures of "demand."
   (a). Index of factory payrolls.

(b). General price level.
(c). Level of prices of all farm products.
(d). Incomes of industrial workers.
2. Per capita consumption of 10 livestock products.
3. Per capita production of 10 livestock products.
4. Number of chicks hatched.
5. Number of chicks raised.
6. Amount of rainfall during brooding season.
7. Temperature during brooding season.
8. Rate of lay.
9. Cost of chicks.

The poultry-feed ratio, the egg-feed ratio, and a combination of eggs and poultry into a unit called the poultry-and-egg-feed ratio were found to have only a low degree of association with numbers of hens and pullets on farms. Ratios for several months and combinations of months were worked, but none was found to be important. The ratios were constructed in such a way that they did not adequately reflect internal adjustments within the component parts of the ratios. The statistical significance of individual items was appreciably greater than their joint determination when interpreted as ratios.

Numbers of hens and pullets in Indiana respond to changes in prices of feed and of poultry products, and to very little else.

Time of Year When Farmers Make Decisions

In Indiana most chicks for replacement-flock purposes are hatched between February 15 and April 15. Eggs must be set 3 weeks earlier. Orders for chicks are generally made a week or two before eggs are set. Consequently, most farmers must have their chick orders pretty well in mind by late February or early March.

The three winter months, December, January, and February, were the critical months when relative prices of feed, prices of eggs, and prices of poultry meat were more closely related to numbers of hens and pullets on farms as of January 1 the following year. This means that farmers presumably look at prices during this period and decide upon how many birds they want to have a year later.

Prices of feed and poultry products during various months were related to the number of hens and pullets on hand January 1 a year later. The percentages of variation in numbers of hens and pullets on Indiana farms January 1 which was associated with variation

in relative price of feed and prices of eggs and poultry during different months were as follows:

Month	*Percent*
December	66
January	76
February	68
December—January	56
December—January—February	80
January—February	79

Thus, these data indicate that, although all winter months were important, January was the key month. Many additional combinations of months were tested in attempting to find the critical time when decisions were made. Months earlier and later than January were less important than January itself. Apparently the farmer's decision is based on price relationships during a relatively short period of time. When averages of 6 or 12 months were used, the degree of association was generally less.

A Formula for Predicting Numbers of Hens and Pullets on Indiana Farms a Year Later

A regression equation was obtained as follows:[4]

X_1 = Number of hens and pullets on Indiana farms January 1, 1928 as a percentage of the number on farms January 1, 1927.

X_2 = Relative price of poultry ration in winter (Dec. Jan. Feb.) of 1927 as a percentage of the price in winter of 1926.

X_3 = Price of eggs in Indiana in winter of 1927 as a percentage of the price in winter of 1926.

X_4 = Price of poultry meat in Indiana in winter of 1927 as a percentage of the price in winter of 1926.

$$X_1 = -0.22523X_2 + 0.08741X_3 + 0.04004X_4 + 109.643$$

The working of the method may be illustrated as follows:

Year	Relative price of poultry ration in winter		Price of eggs in winter		Price of poultry in winter		Number of hens and pullets on farms January 1	
	Relative price (1935–39 dollars)	Percentage of preceding year	Price	Percentage of preceding year	Price	Percentage of preceding year	Percentage of preceding year (calculated)	Number
1947	$1.40		$.371		$.256			15,570,000
1948	1.67	119	.459	124	.251	98		
1949							98	15,259,000*

* Calculated.

[4] Years shown in the equation are for the purpose of illustrating the time lag; the equation is the same for the entire period.

TABLE 3. NUMBERS OF HENS AND PULLETS ON INDIANA FARMS JANUARY 1 IN PERCENTAGE OF PRECEDING YEAR AS INDICATED BY FORMULA AND AS ACTUALLY REPORTED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE, 1928–48

Year	Numbers in percentage of preceding year	
	Actual	Indicated by formula
	Percent	Percent
1928	96	101
1929	95	96
1930	104	102
1931	97	100
1932	95	91
1933	98	97
1934	100	101
1935	92	93
1936	106	109
1937	103	108
1938	90	91
1939	104	103
1940	101	99
1941	96	94
1942	108	104
1943	113	107
1944	108	105
1945	92	95
1946	101	102
1947	99	99
1948	98	104
1949		98

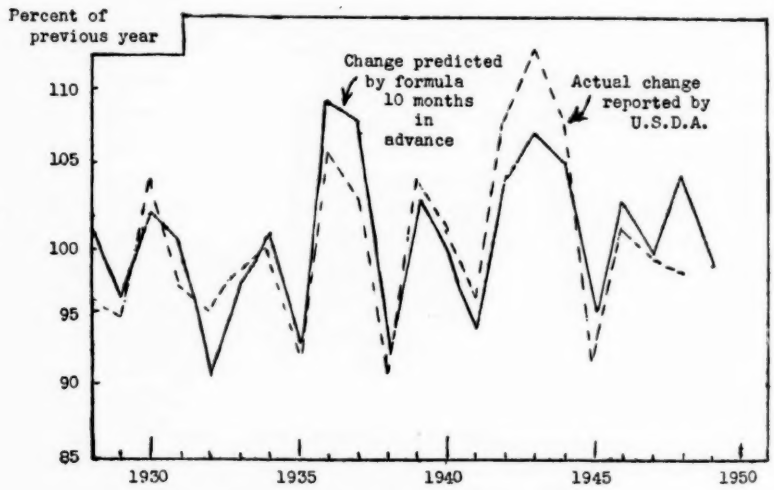

FIG. 1. ACTUAL CHANGES IN NUMBERS OF LAYERS ON INDIANA FARMS COMPARED WITH CHANGES PREDICTED 10 MONTHS IN ADVANCE BY FORMULA

The relative price of feed in 1935–39 dollars in the winter of 1948 was $1.67, or 119 percent of the preceding year. The price of eggs was $0.459, or 124 percent of the preceding year. The price of poultry meat was $0.251, or 98 percent of the preceding year. When substituted in the regression equation, these factors indicate that the numbers of hens and pullets on Indiana farms January 1, 1949 should be about 98 percent of the preceding year or about 15,259,000 birds. Preliminary estimates of the USDA for the United States, made after the hatching season in general confirm these statistical results.[5]

Table 3 and figure 1 give an historical record of the degree of accuracy obtained by applying this method of prediction from 1928 through 1948.

In 17 of the 21 years, the method of estimation correctly predicted the direction of the change. Greatest errors were for 1943 and for 1948, when the estimate deviated from the actual number by 6 percent.

Unfortunately the formula does not take into account the effect of changes that occur after February. However, despite these disturbances, four-fifths of the variation in numbers of hens and pullets was explained. Whatever happens after February appears to have only a minor effect on numbers of hens and pullets farmers will have on hand the following winter.

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ECONOMIC INFORMATION IN FARM JOURNALS

THE national, regional, and state farm journals are an effective educational force in serving farm people. The 150 and more such publications have a circulation of about 20 million, or approximately three journals per farm and village family. A sizeable proportion of the subscribers live in cities. Probably a like number of farm families are not taking a single farm journal. A few studies indicate that the journals are influencial in affecting the opinions and actions of the farm subscribers.

[5] The United States laying flock on January 1, 1949 is expected to be about 95 percent as large as in January 1948. *The Poultry and Egg Situation*, Bur. Agr. Econ., PES 126, April 1948, p. 3.

A study was made to determine the emphasis of the farm journals on the social sciences, on human relations, and on the rural church and religion. A measurement of the space devoted to these fields was started, but the end product was a quantitative analysis of the total contents of 60 farm journals. Five types of journals were included—11 livestock, 5 special crops, 11 farm organizations and cooperatives, 3 agricultural leaders, and 30 standard farm journals. One issue was selected for each journal during the period January–July, 1946.

UTILIZATION OF SPACE IN SIXTY FARM JOURNALS

	Thirty standard farm journals		Sixty farm journals	
	No. with item	Percent of space	No. with item	Percent of space
Advertising	30	53.65	58	49.92
Farm organization and cooperatives	21	1.22	48	4.76
Production information	30	16.78	57	15.80
Economic information	29	4.20	56	4.99
Government and agriculture	30	3.68	56	4.96
Relationships of people	20	1.26	37	1.46
Problems of other groups	7	.26	13	.38
Religion and philosophy	22	1.20	34	1.02
School and education	10	.36	21	.82
Children and youth	25	2.10	42	2.07
Women's interests	30	6.20	48	4.28
Community	7	.55	9	.29
Health and accidents	21	.91	34	.93
Recreation and hobbies	17	1.24	23	.76
Letters—opinions and answers	21	1.52	29	.89
History	2	.17	6	.39
Shows and sales		.31		1.12
Miscellaneous		4.37		5.16
		100.00		100.00

The study involved several problems and limitations. The topics treated vary with the seasons, yet only one issue per journal was analyzed. The sample may not be adequate for seasonal coverage. Many articles were difficult to classify under the topics. The sample, however, shows some interesting facts.

About one-half of the space was devoted to advertising, or to earning a living for the staff and investors (see Table). Stories on farm organization and cooperatives amounted to 4.76 percent, largely due to the fact that the 11 special journals of this type devoted 18.62 percent of space to this field. The standard farm

journals, with a few exceptions, presented a minimum of articles on cooperatives.

The educational emphasis is on production information. Upon this the journals have built their reputation and also their subscriptions. They utilize the staffs of the production departments of the agricultural colleges very extensively.

About 5 percent of the space was used for economic topics—general information, markets, marketing, prices, farm management, conservation, and tenancy in that order. Farm credit was omitted even though there are at least two million farmers handicapped partly because of inadequate size of the farm business. Another 5 percent covered national agricultural policies, with major emphasis on eliminating the price controls existing in early 1946. International relations received 1.08 percent of the space. Other fields of human relations—home and family, community, race, religious groups, rural-urban, farmer-labor, and farmer-business relations—were almost forgotten, receiving only .38 percent of the total space. Other topics of interest to the social scientists—community activities, problems of labor and industry, and history—totaled 1.06 percent. If articles on farm organizations and cooperatives are included, the social sciences received 17.25 percent of the total space in the farm journals.

Articles on religion and the church were found in 22 journals. Several papers were vitally concerned about this area of life, but the average space allotted was only .53 percent of the total.

Topics of primary interest to farm women—nutrition and food, clothing, home and farmstead improvement, women organization, home management, household equipment, and manners and etiquette—were included in 48 journals.

The standard farm journals, especially, are attempting to provide topics of interest to every member of the farm family. Recreational and hobby items were emphasized by several journals. The farmer flying clubs received excellent publicity.

The articles which emphasized how to earn a living, vocational, and production information were well timed and well written. The social science topics were not nearly so well treated. Several important topics were either almost or entirely omitted—the community, establishing youth in farming, farm credit, farm tenancy, international relations and the community, rural ideals and values, and local industries and community services.

The study raised a number of questions which the author hopes others will explore. What are the characteristics of a good farm journal? What topics should be included during the period of a year? How does the educational job of the farm journals fit into the total responsibilities of all agencies, institutions and organizations in serving farm and rural people? How can a qualitative analysis of the farm journals be made, especially of the social science topics? Have the social scientists given adequate attention to the farm journals as outlets for their findings and ideas?

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PRODUCTIVITY OF AGRICULTURAL WORKERS BY SIZE OF ENTERPRISE AND BY REGIONS

ONE of the important problems in agricultural economics is the question of productivity of farm workers on farms which vary in value of gross output. Louis J. Ducoff and Margaret J. Hagood of the Bureau of Agricultural Economics have attempted to solve this problem by developing a unique method for measuring differentials in productivity.[1] Basing their work on special sample tabulations of the 1940 Census of Agriculture for farms classified by total value of agricultural production in 1939,[2] they calculated the production per "man-equivalent" unit of labor by regions and by value groups of farms.

The "man-equivalent" unit is an approximation to the labor time input and work capacity of the average farm operator who is under 65 years of age and does not work off the farm in excess of 100 days per year. Each operator who is 65 years old or over, or who works off the farm more than 100 days per year, is counted as half of a "man-equivalent" unit. Unpaid family workers are also counted as half units, and hired workers are considered as full "man-equivalent" units.

However, a major discrepancy is apparent in the work of Ducoff

[1] Ducoff and Hagood, *Differentials in Productivity and in Farm Income of Agricultural Workers by Size of Enterprise and by Regions*, United States Department of Agriculture, Bureau of Agricultural Economics, Washington, D.C., 1944 (Processed).

[2] Bureau of the Census, Bureau of Agricultural Economics, and Farm Security Administration, *Analysis of Specified Farm Characteristics For Farms Classified By Total Value of Products*, United States Government Printing Office, Washington, 1943. (Hereafter cited as "Census.")

and Hagood: in estimating the number of hired workers in different value groups of farms, they rely on employment reported by the Census for the last weeks in March 1940 and September 1939. Their assumption is that the ratio of the annual average employment to the average for March 24–30 and September 24–30 is the same for every value group of farms in a major geographic division. Thus, for the United States as a whole, the March-September average number of hired workers in the $1–99 value group of farms is 21,310, or .9 percent of all hired workers; and in the $10,000 and over group it is 428,168, or 17.9 percent of all hired workers.[3] If we turn to the Census report on total cash wages paid during 1939, we find that the $1–99 value group paid out .4 percent of the wages, and the $10,000 and over group paid out 31.1 percent of the wages.[4] Thus we must conclude that the 17.5 percent of the workers on the largest farms received 31.1 percent of the cash wages paid, and the .9 percent on the smallest farms received .4 percent of the wages.

The difficulty lies in the fact that the Census schedule called for the number of family and hired workers working the equivalent of *two or more days* during each week in question.[5] The smallest farms reported an average of 1.42 hired workers per farm which employed labor, and the largest farms reported an average of 9.83 workers per farm.[6] It is obvious that most of the 9.83 workers would have worked full weeks, with perhaps only one or two working part time; it is just as likely that on the smallest farms, the 1.42 hired workers will have worked less than full weeks. In the case of unpaid family workers other than farm operators, counting each as one half "man-equivalent" unit constituted a correction for the bias introduced when counting those family workers who worked as little as two days per week. But no such correction was used for hired workers.

An extension of this error is obvious when it is reported that the wage cost per man-year of hired labor on the $1–99 value group of farms is $176, and on the $10,000 and over value group it is $595.[7]

Ducoff and Hagood are aware of the limitations of their method. They state that

[3] Ibid., p. 103.
[4] Ibid., p. 160.
[5] Ibid., p. 217.
[6] Ibid., p. 103.
[7] Ducoff, *Wages of Agricultural Labor in the United States*, Tech. Bull. No. 895, United States Department of Agriculture, Bureau of Agricultural Economics, United States Government Printing Office, Washington, D.C., 1945, p. 67.

. . . when the estimates of annual average employment for the value classes were related to estimates of total value of production or to net returns to labor, capital, and management, tremendous differences in productivity per worker were revealed between the high and low value of production classes of farms. Such differences are exaggerated by differences in the actual time put into farm work by different classes of workers.[8]

But this reduces the validity and usefulness of the concept of production per "man-equivalent" unit, which was (or should have been) designed to represent a full-time worker on the land.

Our problem here is to find a better measure than that used by Ducoff and Hagood to determine the number of full-time hired workers in each value group of farms during 1939. We might assume that the number of full-time hired workers is proportional to the amount paid out in cash wages in each value group. Thus, since all farms in the $1–99 value group in the United States paid .4 percent of the cash wages, it might be assumed that they employed .4 percent of the workers. As the $10,000 and over value group paid 31.1 percent of the wages, they may have employed 31.1 percent of all hired workers.

However, this procedure must be rejected since there is considerable evidence that wage rates are higher on large farms than on small farms.[9] Larger farms can afford to employ better and more highly skilled workers. If we were to assume that cash wage payments measure the amount of hired labor used, we should err in the opposite direction; the method used by Ducoff and Hagood exaggerates the differences in production per full-time worker in different value groups of farms, whereas this method would conceal much of the differences which actually exist.

It is proposed here to reach a compromise: the number of full-time hired workers in each value group will be estimated by giving equal weight to the amount paid out in cash wages, and to the average number of workers employed for two days or more during the weeks of March 24–30, 1940, and September 24–30, 1939.

[8] Ducoff and Hagood, op. cit., p. 36.

[9] Ducoff, op. cit., pp. 39–40.

Ducoff and Barbara B. Reagan, *Wages and Wage Rates of Hired Farm Workers*, Surveys of Wages and Wage Rates in Agriculture, Report No. 16, United States Department of Agriculture, Bureau of Agricultural Economics, Washington, D.C., 1946, *passim*.

Ducoff and Louis Persh, *Wages and Wage Rates of Harvesters of Special Crops in Selected Areas of 13 States, 1945, A Statistical Summary*, Surveys of Wages and Wage Rates in Agriculture, Report No. 17, USDA, BAE, Washington, D.C., *passim*.

Ducoff, "Do Larger Farms Pay Higher Wages?", *The Agricultural Situation*, October 1944, pp. 17–20.

Thus, the $400–599 value group of the Middle Atlantic Division paid out 2.7 percent of all cash wages paid by all farms in the Middle Atlantic Division.[10] But during the two weeks in question, this value group employed 3.3 percent of all hired workers in the Division working two days or more per week.[11] The average, or 3.0 percent, is taken to represent the proportion of all workers in the Division who were employed in the $400–599 value group. Since there was an average of 216,000 workers employed in the Middle Atlantic Division during 1939,[12] the number of full-time hired workers is calculated as 216,000×3.0%, or 6,480 workers.

This is the refinement we propose to introduce in the calculations of Ducoff and Hagood. Is there any evidence that we are making a reasonable and significant correction? Let us quote from Ducoff and Barbara B. Reagan:

> In each of the three surveys in 1945 the general pattern observed in each region was for the hourly cash wages of regular hired farm workers to be higher on larger farms than on smaller ones. . . . For the country as a whole, the average hourly cash wages of regular workers in September on farms . . . hiring 4 or more man-years of labor during the year . . . was 42 percent higher than on the smaller farms (hiring less than one man-year of labor during the year).
>
> Much of the difference between wage levels on large and small farms in the United States figures is owing to the fact that large farms are relatively more frequent in the West where wages are higher. This means that the relationship between sizes of farm enterprises and wage levels needs to be examined region by region. The size of the enterprise is more clearly evident as a factor in wages of regular farm workers in the North Central States than in other regions. In this region the average of 41 cents per hour received by regular workers on farms that hired 4 or more man-years of work in the year was 32 percent higher than the wages of workers on farms that hired less than one man-year of hired farm work.[13]

If we follow the Ducoff-Hagood procedure, we find that the four lowest value groups in the United States ($1–599) employed 13.8 percent of the workers, and they received 6.2 percent of the cash wages paid. The four highest value groups ($2,500 and over) employed 48.8 percent of the workers who received 67.6 percent of the cash wages. This makes it appear that the larger group pays a wage

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[10] Census, p. 160.
[11] Ibid., p. 103.
[12] *Farm Wage Rates, Farm Employment, and Related Data*, United States Department of Agriculture, Bureau of Agricultural Economics, Washington, D.C., 1943, p. 159.
[13] Ducoff and Reagan, op. cit., pp. 12–13.

rate which averages 208 percent above that of the lower group.

With the revised method proposed here, 10.1 percent of the workers appear in the lower group, and they receive 6.2 percent of the wages. The upper group employs 58.2 per cent of the workers and pays out 67.6 percent of the wages. This involves the assumption that wage rates on the bigger farms are 89 percent higher than those on smaller farms.[14]

Similarly, calculations for the East North Central Division reveal that the upper value group shows a wage rate 130 percent higher than that of the lower group if computed by the Ducoff-Hagood method; with the revised method, the difference is 56 percent. For the West North Central States the figures are 95 percent and 42 percent.[15]

A tabulation of results will outline more sharply the extent of the differences between the two methods:

	Ducoff-Reagan (Statistical Summary)	Ducoff-Hagood (Calculated)	Revised (Calculated)
	During 1945, farms hiring 4 or more man-years of labor paid more per hour than did farms hiring less than 1 man-year, as follows:	During 1939, the $2,500 and over value group paid higher wages per full-time worker than did the $1–599 group, as follows:	
United States	42%	208%	89%
E.N. Central	32%	130%	56%
W.N. Central		95%	42%

It should be reiterated that the calculations which we attribute to the Ducoff-Hagood method are based on the assumption that "man-equivalent" units of hired workers are full-time units of hired workers. Since they have hinted at a denial of such an interpretation they may escape the criticism developed here, but then it is difficult to see what meaning their concept of "man-equivalent" has.

It may be argued that the above tabulation still shows considerable discrepancy between the statistical findings of wage differentials, and the revised calculations. By giving unequal weights to cash wages paid and the number of workers employed during the last weeks of March 1940 and September 1939, we could manipulate the calculations until we obtained figures which appeared to be beautifully exact and in conformity with the statistical findings

[14] Census, pp. 103, 160.
[15] Ibid., pp. 103, 105, 160, 162.

of wage differentials. But there is little purpose in such sleight of hand. The statistical figures for 1945 are not strictly comparable with the estimates for 1939. The $1–599 and the $2,500 and over value groups which were chosen for comparing wage differentials in 1939 were selected rather arbitrarily, and will not coincide with the 1945 comparisons based on farms using four or more man-years of labor, and those using one man-year or less. Also cash hourly wages are only one of several types of payments; the 1945 figures do not consider weekly or monthly wage rates, and the value of perquisites furnished hired workers is not considered in either case. Finally, only regular workers are included in the 1945 statistics, while the 1939 figures include seasonal and occasional help. Therefore, the wage differentials calculated for 1939 and observed for 1945 cannot be identical except by sheer chance.

The point to be empasized here is, that while the revised calculations on gross product per full-time worker are only rough approximations, they introduce a necessary and important correction in the work of Ducoff and Hagood. Table I below shows the extent of the differences.

TABLE I. TOTAL VALUE OF PRODUCTS PER FULL-TIME FARM WORKER, FAMILY AND HIRED, BY VALUE GROUPS OF FARMS, BAE AND REVISED FIGURES, 1939

Value Group	United States		Value Group	United States	
	BAE	Revised		BAE	Revised
$1 – 99	82	83	$1500–1999	1087	1080
100– 249	200	204	2000–2499	1298	1279
250– 399	315	321	2500–3999	1599	1534
400– 599	424	434	4000–5999	1926	1749
600– 749	525	541	6000–9999	2312	1949
750– 999	641	658	10,000 & over	2850	2062
1000–1499	837	849			

To calculate net product per full-time worker, the amounts spent on commercial fertilizer, liming materials, feed, implements and machinery, gasoline, kerosene, distillate, oil, and building materials[16] were subtracted from the gross value of farm products produced in each value group. The above list of expenses omits some important items which should be included, and it includes certain sums which are capital investments rather than current production expenses. The expenses deducted here constitute 27 percent of gross farm income. All current production expenses in 1939 (given

[16] Census, pp. 166–174.

by the United States Department of Agriculture)[17] constituted 42 percent of gross farm income. We must here use the less complete Census figures, rather than those of the USDA, because the latter are not broken down by value groups.

The table below shows net product per full-time worker. While it overstates the net product because not all production expenses are deducted, it is of interest in showing the differences between value groups and between regions. These figures are not comparable with any worked out by Ducoff and Hagood.

TABLE II. NET PRODUCT PER FULL TIME FARM WORKER, FAMILY AND HIRED, BY VALUE GROUPS OF FARMS AND BY GEOGRAPHIC DIVISIONS, 1939

Value Group	U. S.	New Eng.	Mid. Atl.	E.N. Cen.	W.N. Cen.	So. Atl.	E.S. Cen.	W.S. Cen.	Mtn.	Pac.
$ 1- 99	−9	−77	−87	−49	−24	24	40	22	−41	−84
100- 249	115	57	17	87	98	126	147	132	71	19
250- 399	224	147	123	225	197	220	246	242	193	171
400- 599	320	194	216	324	305	308	348	344	251	263
600- 749	408	288	347	419	416	380	435	432	346	378
750- 999	489	359	373	526	503	455	523	491	478	532
1000–1499	621	549	490	687	681	552	615	585	648	659
1500–1999	779	625	615	890	885	618	731	691	925	745
2000–2499	852	686	753	1053	1050	689	773	792	1051	910
2500–3999	1104	840	883	1313	1331	747	785	832	1218	1131
4000–5999	1246	977	968	1583	1727	672	646	931	1471	1217
6000–9999	1416	1212	978	2074	2242	650	783	946	1811	1575
10,000 & over	1600	1291	1248	2128	3269	683	627	1273	2300	1954

In conclusion, it will be noted that the larger the farm (measured in terms of gross output), the more each full-time worker produces. These differences in productivity are considerable, although smaller than those worked out by Ducoff and Hagood.

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AN EDUCATIONAL PROGRAM IN AGRICULTURAL LAW

Introduction

FARMERS and students of agriculture have a concept of law which lies somewhere between complete ignorance on the one hand and complete understanding on the other. If the famous maxim "Ignorance of the law excuses no one" were given a literal application, complete understanding would become a paramount life objective. But there is another saying popular with the legal

[17] *Agricultural Statistics, 1946*, Government Printing Office, Washington, D.C., 1946, pp. 563–4.

profession: "A little learning is a dangerous thing." From this it is argued that a layman briefly exposed to legal learning couples this exposure with his imagination, and when a legal problem besets him produces a solution which, say some members of the profession, is invariably wrong. Obviously the correct approach to legal learning is represented by neither of these adages. It is impossible for anyone to learn and keep abreast of all the laws which affect him and his business, so that in a sense lawyers themselves have only a smattering of law, farmers only a smattering of the science of soil maintenance and improvement, and ministers only a smattering of the theology which will make large numbers of bad men good and larger numbers of good men better. If we accept the proposition that partial learning is all that is possible in any field, we might be willing to accept the conclusion that successful use of this partial learning depends at least as much on the judgment and acumen of particular individuals as it does on any measured amount of factual knowledge possessed by them. Belief in this conclusion is necessary if we intend to support an educational program in agricultural law—or in soil physics or farm management or beekeeping.

Extent of the Program

Generally the current subject matter in our agricultural colleges is considered from three viewpoints: that of the scientist and research worker, that of the teacher of college students, and that of the adult educator or extension worker. It is good for the subject matter to be approached in all these ways. Its growth is promoted, its vigor maintained, and its defunct parts eliminated at more frequent intervals. Perhaps this latter virtue is less discernible in college course outlines than in extension workers' programs, but at any rate the elimination process is accelerated when the results of research are applied quickly and when the experience of farmers and students finds a ready avenue back to research workers. Law does not differ from other types of subject matter in these respects, and a thoroughgoing educational program should include teaching, extension, and research in proper balance.

Administration of the Program

When a new field of learning is being developed, it is important that it have an opportunity to explore relationships with estab-

lished fields, that it be placed in a healthy administrative climate, and that its personnel have among other attributes the particular educational background necessary not only to visualize the contributions which the new field can make but also to work minutely with the subject matter involved. Under present college organization a program in agricultural law fits most naturally into a department of agricultural economics, rural social science, or rural sociology. But it will touch the work of all departments or divisions in the college, the experiment station, and the extension service. Conceivably the work in agricultural law could be given departmental status. However, this seems to be a relatively unimportant consideration as against the general attitude and interest of those under whom the program is organized, whether division head, department head, or dean.

It seems imperative that personnel who do the work have college training both in agriculture and in law. Graduation in agriculture and in law, a Master's degree in agricultural economics, and a farm or rural background would all be ideal. The completion of such an educational program, including one year of graduate study, would take seven academic years in institutions such as the University of Illinois, which have a combined agriculture-law curriculum, or eight years in an institution requiring a degree in agriculture for admission to law school.

A Teaching Program in Agricultural Law

Good teachers are never modest about the scope of their subject matter. An intent rural sociologist, for example, can conceive of political science, economics, ethics, law, history, and geography as part and parcel of his field and might sooner or later seek to establish courses in these and other subjects if such courses did not already exist. Law is like sociology—it touches people and their occupations at myriad points, and the selection of those points which should be pulled together to comprise a college course is not easy, nor will it ever be done with finality.

The teaching program developed thus far at the University of Illinois consists of one three-hour course entitled "Agricultural Law." It is conducted on a mixed lecture-discussion basis, with interruptions which serve to clarify the thinking of students—or the instructor—welcomed at any time. Assignments are partially in texts, partially in special reserved materials, and partially in cur-

rent mimeographed or printed matter. The weekly subjects for a sixteen-week semester as presented in the current academic year were:

Week 1. Introductory—course objectives, the setting, some basic concepts, studying law.
Week 2. Law and legal systems—sources of law, an outline of our legal system and its operation.
Week 3. Legal characteristics of owner-operatorship—methods of holding land, titles, abstracts, recording, use as security.
Week 4. Methods of acquiring property—purchase, will, gift, descent, instruments used, adverse possession.
Week 5. Rights of an owner to use his property—surface and mineral rights, right to encumber, convey, destroy; nuisances, air rights, land support, trespass.
Week 6. Easements, natural property rights, and soil conservation.
Week 7. Farm drainage and irrigation.
Week 8. Farm tenancy—legal and economic relationship of farm landlord and tenant.
Week 9. Farm leases.
Week 10. Legal characteristics of professional farm management.
Week 11. The legal status of farm labor.
Week 12. Fences, brands, and trespassing livestock.
Week 13. Chattel mortgages, conditional sales, and agricultural liens.
Week 14. Legal aspects of marketing.
Week 15. State regulatory laws—feed, seed, fertilizer, animal disease, and others.
Week 16. The operation of county and local government—discussion of the system, its relationship to farmers and their organization, its shortcomings, and suggested solutions.

Certain of these subjects lend themselves to more expansion than a week's time will permit. As interest in agricultural law develops it is foreseeable that such subjects as drainage and irrigation, livestock and fence law, landlord and tenant and marketing could themselves become the basis of special problems for students or the nucleus of advanced courses for those with specialized interests. At the moment it would seem that a single course in agricultural law should do four things:

1. Give students a greater awareness of legal-social-economic relationships.
2. Get across to the student a few principles basic to an understanding of law.
3. Improve the student's comprehension of legal implications and of the sources of help.
4. Arouse curiosity. (If it doesn't do this, it will probably fail in the other three.)

Other courses at the University of Illinois in which one or more class hours have been devoted to legal principles are farm appraisals, home management, feeds and feeding, dairy plant management, and rural sociology.

A Research Program in Agricultural Law

During recent years more and more state legislatures and other deliberative bodies have provided themselves with legal research agencies having as their primary objective the making of studies and recommendations on proposed legislation, or on subjects which might be incorporated in legislation. A program of research in agricultural law can do for agriculture and for educational workers in agriculture what these special agencies do for state legislatures. Such a program can initiate surveys and studies designed to show what effect laws have had on the economic and social usefulness of such devices as the landlord's lien, farm leases, chattel mortgages, conditional sales, township government, county road administration, systems for the administration of property, tax foreclosures and redemption, seed inspection requirements—in short, on anything circumscribed by law and having an important daily or periodic application to large numbers of farm people. From time to time these and other legal devices command the attention of farmers and their organizations, sporadic studies are made, preconceived ideas are bolstered, and some "red hot" recommendations are adopted in the organization platform and shouted in the legislative ear. The recommendations may or may not be good, and even if good they may or may not incorporate sufficient thoroughness and vision for long and successful use. This is not an argument against such democratic human proclivities; they should and must continue. Rather it is to be argued that every state college of agriculture should have an agency which makes the procuring of basic information on the operation of laws germane to agriculture a continuous and orderly process. Such would be the function of a research program in agricultural law. The range of its activities would be limited only by funds and competent personnel—good research workers are no more modest than good teachers.

Current projects at the University of Illinois are centered in three areas:

1. The preparation of a farm drainage law manual.
2. A study of the operation and usefulness of certain types of agricultural liens.

3. A study of local government efficiency, beginning with single functions at the township level.

The results of such studies will be used as the basis for educational meetings, in the preparation of informative published materials, as basic data for further research, and in supporting any legislative changes that the findings may indicate.

An Extension Program in Agricultural Law

Farmers want and need certain facts at certain times. Only during periods of extreme leisure will some of the more inquisitive and persistent seek general learning for the sake of more general learning. In that respect farmers are like most other people. Some facts which farmers need to know are a necessary part of their daily decisions, others are called out intermittently, and still others may arise infrequently or not at all. Only a few principles of legal learning fall in the first category, many such principles fall in the second, and still more fall in the third. It would not be profitable for a farmer to spend hours learning the details of eminent domain procedure in his state against the time when the county might condemn a strip of his land for a highway. But it would be profitable and necessary for a farmer to know the details of his state seed law if he expects to offer agricultural seed for sale to other farmers—and a knowledge of the fence laws of his state would seem desirable since he maintains his fences all the days of the year.

But the truth remains that problems must arise to promote learning. Therefore, the legal information which is extended to farmers by radio, meetings, short courses, news releases, and other devices must appear vital to substantial numbers of them. At the University of Illinois the following extension activities have seemed well received and worth while:

1. A weekly news release entitled *Law on the Farm* covering important state statutory laws and common law principles applicable to the farm business. These articles serve also as a vehicle to explain new legislation and new interpretations or changes. Periodically an index is issued, and farmers and agricultural workers with a specific problem can request back numbers.

2. A *Farm Law Question Box* radio program.

3. Farmers' evening school and veteran trainee meetings, usually on a county-wide basis, at which the most important subjects are discussed briefly, then covered more thoroughly and more interest-

ingly in a question and answer period. The subjects which receive major attention at such meetings are landlord-tenant relationships, farm leases, fences—particularly division and hedge fences—drainage, the farm employer's liability, farm vehicles on highways, dogs, trespassing livestock, hunters and trespass laws, and various state regulatory laws (seed, feed, fertilizer, Bangs disease, community sales, dead animal disposal).

4. Special meetings n communities which desire to take advantage of certain types of enabling legislation and wish to have the law explained. Examples are laws providing for the establishment of fire protection districts and wild life districts.

5. The handling of a substantial volume of correspondence raising legal questions and seeking information.

6. Frequent articles of special interest in appropriate publications. For example, "The Legal Rights of Tree Owners" in a State Horticultural Society news letter and "Law on the Livestock Farm" in a breed magazine.

Conclusion

A program such as the one outlined, bearing a deep significance to social and economic concepts, would seem to be a "must" in any educational institution which puts a high priority on achieving balance and integration in its subject matter. But such a program cannot succeed without personnel with training in both law and agriculture, and without personnel with the ability to handle wisely legal facts and information. Such an agency should develop neither into a legal aid clinic, except perhaps in a restricted sense, nor into a halting and hesitant dispenser of bits of general information.

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MEASURING THE ECONOMIC PRODUCTIVITY OF LAND*

A THOROUGH knowledge of the productive characteristics of land is essential in planning the use of land. Farm lending agencies and prospective farm buyers and sellers need reliable information on the relative values of tracts of land. Problems arising in the assessment of farm real estate have led to demand for an objective basis for determining assessed values of land. The value of soil conservation practices and other practices depends to a large extent on the productivity with and without the practice. The productivity, both physical and economic, of tracts of land is useful information in other ways.

The purpose of this paper is to describe and appraise the budget method in measuring the economic productivity of tracts of land. For purposes of measuring economic productivity, the tract of land under consideration should be an area in which the management and yields are reasonably uniform. A good soil map should provide the basis for delineating the area. A soil map may be satisfactory in general, but not necessarily in specific cases. The criteria for delineating soil areas are not always relate to productivity.

Meaning of Economic Productivity

Economic productivity of land is the net income attributable to the land. It is receipts less all expenses except a charge for the land. The present economic value of a tract of land is a sum of the discounted future net incomes. This value depends on the net incomes and the discount rate. If only relative values instead of absolute values are desired, the rate of discount is immaterial; in fact no discount rate is needed as the net incomes can be compared directly. This assumes constant incomes in the future, or the same relative change in incomes from year to year for the tracts of land being compared. The more difficult problem is estimating the future net incomes.

Net income to land varies with the intensity with which the land is used. Intensity refers to the quantity of other factors of production applied to a given area of land. It involves the use of the land (corn, alfalfa, pasture, etc. or some combination of uses) as well as

* Contribution No. 147 from the Department of Agricultural Economics, Kansas State College.

the factors of production. As the intensity is increased, the total product will tend to increase but at a diminishing rate. Eventually the total yield may decrease. The additional product diminishes as the quantity of variable factor or factors increases. With given prices for the product and for the cost factors, a point is reached where the value of the marginal product is equal to the cost of the additional quantity of the factors. The net income will be a maximum at this point. When their net incomes are maxima, tracts of land differ with respect to use, quantities of other factors of production (capacity) and the efficiency in their use of the factors. These varying physical quantities of inputs and outputs must be expressed in monetary values to compare the economic productiveness of different tracts of land.

Budget Method of Measuring Economic Productivity

The economic productivity of a tract of land can be estimated by preparing a budget. Physical production and requirements are computed and by using prices to determine the receipts and expenses, the net return for the land is obtained. A major part of farm budgeting is to obtain appropriate data on prices and physical inputs and outputs.

If maximum net return for the land is desired, a vast amount of input-output data is needed to determine the marginal revenue and marginal cost for various uses of the land and combinations of factors of production with the land. Detailed data of this type are scarce. Most input-output data are averages which do not permit estimating marginal revenue and marginal cost. However, experience and research provide some guides for determining approximately the best use and combination of factors of production. A comparison of net returns as obtained by the typical farmer appears most practical and useful.

The problem of estimating the net return for one kind of land is complicated by the fact that the land probably should have a combination of uses. Also, most farms consist of more than one kind of soil with respect to productivity, which means further complications in the uses of the land. Livestock may be included in the farm business, and complementary and supplementary relationships and joint costs may be involved and may mean that the farm should be treated as a whole. The difficulty exists of allocating the total net returns to each tract of land. There is no exact way of

doing this. It is necessary to deviate from the ideal and select a procedure which is practicable.

Yields and unit requirements which represent averages for a typical farmer generally must be used. If the net return is to be capitalized to estimate the present value of the land, the averages should represent what can be expected in the future. This applies particularly to the prices chosen. Records of the past generally must be used as a basis for establishing the expectations.

Little is known about the yielding capacity of different kinds of soils. Most estimates of yields according to kind of soil are relative yields determined largely by subjective means. That is, the relative ratings are primarily the opinion of soil technicians rather than the direct results of analyses of yield data.[1] A few studies of yields have been made for objective measurements of yields.[2]

In spite of the weaknesses in the budget method it has some advantages, particularly in classifying soils where relative rather than absolute values are emphasized. By using approximately the same "standards" of requirements and prices, net incomes can be calculated with essentially one variable—physical yield of the land. The writer has used the method for classifying soils in two areas in Central Kansas according to economic productivity.

A farm of 320 acres with 160 acres in cropland was chosen as a typical farm for areas on the western border of the Bluestem Belt in Kansas. Budgets were prepared first for average crop and pasture land in the areas. County average yields of crops and pasture were used.[3] Unit requirements of labor, feed, seed, fuel, and other factors were developed from data obtained in various cost studies.

Three basic budgets were prepared for average yields: (1) 320 acres with 160 acres of cropland called "combination" budget, (2) 160 acres of cropland called "crop" budget, and (3) 160 acres of pasture called "pasture" budget. The combination budget more nearly represents the real farm situation, but it is difficult to allocate the net returns to the cropland and to the pasture land. The

[1] The recent soil survey reports provide a table giving a subjective rating of the soils. See S. R. Bacon, David Taylor, Alfred Boileau, and Gerald Yoder, *Soil Survey, Union County, Pennsylvania*, U.S.D.A. and Penn. Agr. Expt. Sta. Series 1940, No. 2, Sept. 1946.

[2] For an example see William G. Murray, A. J. Englehorn and R. A. Griffin *Yield Tests and Land Valuation*, Iowa Agr. Expt. Sta. Research Bul. 252, March 1939.

[3] County yields of crops are published annually by the Kansas State Board of Agriculture. Pasture yields are estimates made by representatives of the Kansas Agricultural Experiment Station for production adjustment studies.

crop budget and pasture budget are less real, but avoid this problem. However, in preparing these two budgets it is necessary to select unit requirements which divide joint costs between crops and pasture.

The land use and livestock in the three basic budgets are shown in Table 1. A summary of the receipts, expenses, net incomes, and capitalized values for the three budgets is shown in Table 2. The capitalized value for the combination budget is $49.60 per acre, crop budget $70.40, and pasture budget $29.00. An average of the capitalized values of the crop and pasture budgets is $49.70 or al-

TABLE 1. LAND USE AND LIVESTOCK IN THREE BASIC BUDGETS FOR CENTRAL KANSAS FARMS

Land use and livestock	Combination budget	Crop budget	Pasture budget
Total land (acres)	320	160	160
Cropland	160	160	
Corn	40	40	
Oats	40	40	
Wheat	40	40	
Alfalfa	40	40	
Pasture	160		160
Livestock (numbers)			
Milk cows	4		
Hens	100		
Deferred-fed calves	35		
Grazed yearlings			32

most the same as the capitalized value of the combination budget. The capitalized value of $49.60 is about 20 per cent above the average census value of farm land for 1910, 1920, 1930 and 1940, which was $41.43. Unpublished data from crop reporters in 1945 show values substantially above the values reported in the 1945 Census of Agriculture.[4]

The common share rent for small grains is one-third, and for other crops sometimes two-fifths. One-third of the total receipts in the crop budget is $622.70 which is slightly less than the net income of $651.91. This appears as further evidence that the computations in the three budgets are suitable as bases for determining the capitalized values for soils deviating from the average in physical productivity.

[4] Data obtained from tabulations of the Agricultural Statistician in Kansas, Bureau of Agricultural Economics, U.S.D.A., Topeka, Kansas.

TABLE 2. RECEIPTS, EXPENSES, AND NET INCOME ATTRIBUTABLE TO THE LAND IN THREE BASIC BUDGETS FOR CENTRAL KANSAS FARMS

Receipts and expenses[1]	Combination budget	Crop budget	Pasture budget
Receipts:			
Wheat	$ 490.45	$ 555.90	
Alfalfa	240.00	608.00	
Corn		388.80	
Oats		315.40	
Butterfat	210.00		
Eggs	126.54		
Poultry	78.00		
Deferred-fed calves	3,172.75		
Grazed yearlings			$1,819.20
Total	4,317.74	1,868.10	1,819.20
Expenses:			
Livestock purchased	1,061.20		1,317.12
Crop expenses	123,01	133.02	
Livestock expense	195,82		142.48
Fuel and oil	109,57	109.57	
Other machinery expense	640,00	480.00	19.20[2]
Man labor	754,50	312.00	24.00
Horse labor	15.52		6.40
Taxes (except land)	50.00	17.60	.80
Interest (except land)	312.50	110.00	39.28
Building expense	135.00	54.00	
Total	3,397.12	1,216.19	1,549.28
Net income (including land tax)	920.62	651.91	269.92
Taxes[3]	127.05	88.96	37.25
Net income to land	793.57	562.95	232.67
Net income per acre	2.48	3.52	1.45
Capitalized net income (5%)	49.60	70.40	29.00

[1] Average prices for 1919 to 1939 were used insofar as possible.
[2] Fence upkeep.
[3] 13.8 percent of net income for the land tax.

The prices used in estimating the receipts and expenses are highly important for estimating the economic productivity of land. Because the value of land is based on future incomes, expected prices for the future should be used. It is necessary usually to base the expected prices on historical data. Changes in the base prices may be needed to allow for expected changes in supply and demand conditions. The prices used in this study were based largely on 1919 to 1939 averages. The problem of selecting prices for estimating the economic productivity of land needs additional study.

Most of the costs were considered as fixed for different grades of

land. As the physical productivity of the land deviated from the average, the expense for labor, fuel, oil, machinery, buildings, taxes, and interest was adjusted for changes in harvesting and storing the larger or smaller crop. It is questionable whether land with a large yield should be charged with higher costs than land with a low yield. Frequently the lower yielding land consists of a heavy soil and may be steeply sloping and gullied. The costs probably are higher on this type of land than on the better land. There is little information available on this subject.

For each one point change in the relative physical soil rating for crops, the value of the land changed $1.54 an acre for crop production and $0.07 for pasture. A soil which normally will produce yields of less than about 55 percent of the average cropland soil in Central Kansas has no economic value as cropland. When the normal yield for a soil is less than 75 percent of the yield for the average cropland soil in Central Kansas, the land will be worth more as pasture land.

One application of the results of estimating the economic productivity of land for crop and pasture production is in determining adjustments in land use. In one of the sample areas a land type designated IIIB4[5] was being used largely for crop production. The study showed that it had no value normally for crop production, but would be worth $27 an acre as pasture. This land type existed in comparatively large areas. It was not a matter of small areas in fields of better soils which should not be retired from crop production. The opposite situation existed for two other land types which might be changed from pasture to crop production. Needs of the farm and other factors should be considered in recommending changes in land use in individual cases.

Summary

The economic productivity of a tract of land is the net income attributable to the land. An estimate of the net income may be made by the use of a farm budget in which physical inputs and outputs are estimated, and by the use of prices the net return to the land is obtained. The present value of a tract of land is a sum of the discounted future net incomes. Using a five percent discount rate in a study in Central Kansas the average cropland had a

[5] Deep, dark soil with heavy clay or claypan subsoil, undulating to sloping with very severe erosion.

value of $70.40 an acre and the average pasture a value of $29.00. The value of the average land for a farm with one-half cropland was $49.60 an acre. This is about 20 percent above average census values from 1910 to 1940. For each one point change in the relative physical soil rating for crops the value of the land changed $1.54 an acre for crop production and $0.07 for pasture. Land on which crop yields were normally less than 55 percent of the average cropland in the area had no value as cropland. If the yield was less than 75 percent, the land was worth more as pasture than as cropland.

W. H. PINE

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BOOK REVIEWS

Soil Conservation—An International Study, Food and Agriculture Organization of the United Nations, Washington, D. C., 1948.

This well-illustrated publication is intended to arouse world awareness of the problem of soil erosion and to stimulate interest in accelerating public programs and private land use which will help conserve the soil. The publication is divided into 11 chapters under 3 general headings: (1) Land—The Physical Base, (2) Losses from Erosion, and (3) Conservation Methods.

The report deals with general principles and illustrations of problems in specific areas. In no sense is it an inventory of the soil-erosion problem in the world. An inventory of the extent and degree of soil erosion would be difficult. Probably the best that could be done would be to classify the types of erosion problems and to indicate the areas in which they occur.

The report intentionally is based largely on the United States and China because, as pointed out in the introduction, both countries have many similarities in area, climate, relief, and soils but great contrast in history and pressure of population on the land. Chinese agriculture dates back 4,000 years or more while agriculture in the important producing ageas of the United States dates back only to the 19th centruy. It may be that contrasting these two countries is not valid when considering the different values placed on the human element. A photograph on page 84 illustrating a group of Chinese completing their alfalfa harvest shows 17 workers with hand tools in a small field. Obviously, the economics of soil conservation under such circumstances differs from that in areas in which labor is limiting factor.

References are made occasionally to various parts of the world other than China and the United States. The chapter on farm lands in the section "Losses from Erosion" contains some discussion of Latin America. Also in the section "Conservation Methods," references are made to the Mediterranean region and the Tropics. Discussion of the Tropics is centered largely around the types of rotation used—(1) polyculture, (2) the corridor system, and (3) kaingining. In "polyculture" two or more crops are grown together in the same field rather than separately in alternate growing seasons. An example of the "corridor system" is alternate strips

of land cleared and used for a 6-year rotation of crops, then left 12 years in forest fallow. The 18 corridors are then arranged so that one may be cleared each year for crop production and one left to revert to forest growth. "Kaingining" seems to mean a piece of land as well as a method of rotation. It is a long-time rotation on steep erodible land where the forest or brush is cleared and the land is cropped for 1 to 3 years. It is then left to revert to weeds and eventual forest cover or planted to special trees such as rubber.

The report would have been improved if the discussion of methods of cultivation and crop rotations had been in a separate section rather than intermixed under the heading "Conservation Methods." Proper crop rotations contribute to soil conservation but many prevailing rotations and cropping practices are definitely exploitative in character.

The last two chapters in the report deal with the soil conservation district program and the Tennessee Valley Authority program of promoting farm adjustments. Also included are brief reviews of national programs in other selected countries. Suggestions are made as to the types of national programs which might be sponsored—education, prices, and subsidies.

The chapter on economic factors is limited to experience in certain parts of the United States and principles developed from studies of these experiences. The core of the discussion is centered around the philosophy that farmers will conserve the soil if incomes from farms are adequate to maintain capital as well as to support families at an accepted standard of living. The chief problem of soil conservation then becomes one of preventing settlement on land that is too unproductive to support a permanent agriculture of the type prevalent in a region. In the discussion of size of farm, lack of knowledge, price depressions, taxation and public finance, overborrowing of money, markets and sources of supply, and public services for rural areas as these affect soil conservation, the emphasis is in terms of how they affect the income available for capital maintenance. From such an emphasis, one might conclude that there should be no serious problems of soil conservation in productive areas. Group or social costs of soil erosion and group or social benefits from soil conservation are not discussed in the chapter on economics; they are relegated to a brief and general treatment in a later chapter.

Permanent solution to soil conservation problems is difficult to

attain because of the difficulty of determining precise goals in both economic and physical terms. Because of this, the general philosophy prevails as stated on page 20 " . . . care must be taken not to force farmers by law or contract to do that which research may disclose to be of doubtful or of negative value, nor in general to force them to do that which will curtail their income." If a nation or community could determine precisely its goal in soil conservation it would be justified in taking action which might limit per acre land income to certain of the owners and operators involved. Individuals could then work out their own solution within this general social framework by changing the size of their farms or seeking off-farm income. Those left on the land would work out a new balance of land, labor, and capital. Certainly, problems of damage from floods, siltation, and gully formation caused by operating units in the upper reaches of watersheds cannot be solved on a permanent basis if no action is to be taken which may limit the income of the operators who are responsible for damage to both private and public property below. Continued expenditure of Federal funds for engineering structures is an easy but only a temporary and partial way out. It works only so long as national legislative bodies continue to appropriate funds for the purpose. Similarly, expanded public ownership for resource conservation may be the easiest way out administratively but not necessarily the most efficient in terms of returns for funds expended.

This general report will serve a good purpose in increasing interest in soil conservation in many countries. The FAO might do well to sponsor international studies of selected problems in the field of soil conservation. The change in systems of farming which must be made if effective soil conservation programs are to be achieved is a broad topic for study. The absence of reference to Europe in the report makes one curious as to what measures have been taken there to prevent soil erosion and to keep land productivity on a high level. A comprehensive world study of what the various nations have done in obtaining group action on the social problem of soil erosion deserves serious consideration. There is room for study of all phases of soil conservation in selected areas in addition to detailed studies of selected topics covering all or many areas of the world.

ALVIN T. M. LEE

Bureau of Agricultural Economics

Soil and Steel P. Alston Waring and Clinton S. Golden. New York and London: Harper & Brothers, 1947. Pp. viii, 240. $3.00.

This book recognizes and aims to allay one of the important frictions in contemporary American society, that between farmers and organized labor. It is written by a small farmer (Waring) and an executive of the steelworkers union (Golden). The product of the joint effort is a readable, at times, eloquent, and provocative book. It tries earnestly, and with no little success, to describe the problems of farmers—especially small farmers—and those of urban workers; and to do so with such clarity and concreteness that each might get a more accurate and sympathetic understanding of the other.

It is quite true as this work makes especially clear that farmers get their opinions of labor unions quite largely from press accounts which are often unfavorable rather than from personal contact. The stereotype of the labor leader which farmers commonly have is one suggested by such words as "thugs" and "racketeers" or "dammed foreigners". Farmers in general have little or no conception of the long struggle of the working men to achieve protection against the exploitive practices of powerful companies which employed them. It is only a few short years ago, for example, that the 12-hour day was abandoned in the steel industry, and then only after a bitter struggle. The authors recognize, however, that the interests of labor unions and farmers are sometimes in direct conflict, as indicated by their story of the Dock Street Produce Market difficulties in Philadelphia, when the introduction of a five-day week robbed farmers of chance to sell their produce on Saturdays; and a regulation that produce could enter the market only in trucks driven by union members prevented them from sending some of their stuff to market by their neighbors. That no effort was made by the Grange and Farm Bureau to negotiate with the union on this problem is condemmed by the authors; as is also the attempts of these two farm organizations to place all the blame on the union when its representative was only one on a board of six which instituted the new policy in the market. The other five members represented the wholesale dealers. The Farm Bloc comes in for criticism as being the mouthpiece of the Grange and the Farm Bureau which in turn represent the "business-minded big agricultural elements in farming", according to the authors. Only

the Farmers Union and its leader James Patton seem to be on the beam and doing and saying the right things.

But if farmers do not understand and sympathize with labor unions, neither do laborers fully understand and sympathize with the farmers. High prices for food, the payment of large subsidies to farmers to sustain farm prices, and benefit payments to get them to practice soil conservation, seem to justify urbanites in accusing farmers of greediness. But the authors contend that workers should realize that farmers, especially the small farmers, are troubled with insecurity as well as are the job holders. Farm prices fluctuate widely, and income for the vast majority is low and uncertain. A bad tenancy system, heavy mortgage debt, and inefficient marketing have resulted in wasted soil and widespread rural poverty. These conditions are apparent.

Urban workers and farmers indeed have many interests in common. Any farmer who gives the matter thought will agree that full employment at high wages for the worker means more in providing a market for his product than any other factory possibly can. Workers understand that profitable farming means a market for the items they produce. This realization has been regarded as a logical basis for a *rapprochement* of these two large elements in American society. Efforts to organize them, however, have not proved successful. The latest attempt, the Farmer-labor party of Minnesota, merged a few years ago with the Democratic party and is apparently on the way to take its place in history along with the Knights of Labor as one more unsuccessful attempt to implement in practice what seems such a logical idea. The point seems to be that American farmers are not only laborers, but enterprisers and capitalists as well. They tend to identify themselves with "business" rather than with labor.

While the book deals with the problem of bringing two segments of society together—laborer and farmer—it must be remembered that there are other important groups in our society which must be considered. The implication is that the two groups with which its authors are concerned are the most important and should unite their forces against what they call Big Business, whether in agriculture or industry. This implication of labor and small farmer against the world comes out in the discussion of what labor and farmers want from education (chapter 13). For example, it is claimed for labor that the "organization and control of education

should represent the whole community. This means more than show-window representation—say, one spokesman for labor on a board of nine. We mean that in a city in which four out of five children come from working-class homes, we are not going to be satisfied with less than a similar proportion of school-board members from that section of the community". This implies that disinterested public service is impossible; that an individual inevitably reflects his occupational interests only. There are many who would disagree with this point of view. It could be argued that there is no more reason to think a majority of wage earners on a board of education could do a better job of guiding the school system than a board composed of predominantly professional or business people. Proportional representation by occupational groups is not the way we have been operating in this country, although the time may come when we will find sufficient reasons why we should change. Until that time comes may we not continue to believe that there are men and women who regardless of occupation can be trusted to represent that indefinable something we call the public welfare. Despite this too-sharp focus on two occupational groups, the book is timely and useful, dedicated to a high purpose of promoting human understanding.

LOWRY NELSON

University of Minnesota

Farming and Democracy, A. Witney Griswold. New York: Harcourt, Brace and Company, 1948. Pp. ix, 227. $3.00.

"Farming and Democracy" to use the authors phraseology is concerned with the testing of an idea—"that farming as a family enterprise is the backbone of democracy". Mr. Griswold sets himself to the task of showing that the maintenance of a large rural population through subsidy or other artificial measures is inconsistent with democracy and a poor defense for democratic institutions; that while there is no universal law that equates agrarianism and democracy, of family farming and democracy, a fully employed and fully productive agriculture which is built around the family farm is consistent with and an intregal part of a democratic society; that democracy should and does spring from other walks of life.

Mr. Griswold demonstrates in a rather convincing manner that democracy has enjoyed its greatest development and growth

during periods when the proportion of the population engaged in farming was declining. He does not give an exact definition of the term "democracy", but he seems to use the term to describe any system of government which is controlled by the people, regardless of the functions that government may perform. The socialist government of England, for example, would still be a democratic government.

The first Chapter outlines the problem. The second deals with the concept of agrarianism from an historical point of view. Quotes from the early Greek and Roman writers are included, but most of the discussion is centered on Jefferson and his agrarianism.

In Chapter Three on "The British Experience", Griswold points out that the British apparently did not share Jefferson's fear of commerce and industry and its effects on government. Furthermore, he says, "they did not identify democracy with the agrarian way of life. This is implicit in the fact that the rise of democracy in Great Britian coincided with the decline of the British farm population to the smallest proportions in the world".

Chapter Four is entitled "The French Contrast". Griswold states " . . . historical evidence to date seems to indicate that democracy has flourished most in the few countries, with the notable exception of Germany, that have attained a high degree of industralization and urbanization". He continues, "It is true, nevertheless, that all the democratic countries except Great Britain have put a premium on family farming and the agrarian way of life, and none so great a premium as France."

Elsewhere he states, "The British experience shows us that it is possible to reduce the farm population to an irreducible minimum, and small, owner-operated family-size farms virtually to extinction and still have democracy. The French contrast shows us that it is possible to maintain a maximum farm population and carry family farming to its extreme logical conclusion, and all but lose democracy in the bargain". At still another point he suggests, "Farmers have been called the backbone of every form of government in the world, including fascism and communism."

Chapter Five deals with "American Policy" and Chapter Six with the author's conclusions and prospects for the United States. Mr. Griswold describes much of the national legislation of the past several decades and its effects on American agriculture and particularly the family farm. He describes many of the activities of

the national farm organizations and various federal and state agencies which deal with agriculture. In some places he is sharply critical and in others he is laudatory.

Mr. Griswold believes that the family farm and democracy should go hand in hand, but he warns that "family farming cannot thrive on terms of hillbillies and Okies anymore than it can amid factories in the field." He believes that there must be "re-employment of large numbers of farmers and farm laborers in non-agricultural occupations, and reallocation of productive resources within agriculture in keeping with present and prospective demand rather than with the *status quo* and the political power to defend it." He is strongly opposed to subsidies and other measures which might prolong an outmoded type of agriculture and hinder or prevent agriculture from adjusting to its present position of under-employment and over-population.

He chides those who extoll the virtues of rural living without due regard to levels of living with such statements as this, "Man's universal respect for the producers of food, his first necessity, and his love of nature, which has grown as his distance from it has increased, have added mystic and romantic elements to the agrarian theme".

"Farming and Democracy" is well-written and a carefully documented piece of work. It contains an amazing collection of factual information concerning agriculture. The casual reader may find Chapters Two, Three and Four a bit tedious, and he may differ on occasion with some of the authors' conclusions, but he will like the book in its entirety and will recognize it as an able and scholarly endeavor. It is an important contribution to the social sciences, and the reviewer commends it particularly to agricultural leaders, government administrators who concern themselves with agricultural affairs, and the entire fraternity of rural social scientists.

CLIFFORD M. HARDIN

Michigan State College

The Agrarian Revolt in Western Canada, Paul F. Sharp. Minneapolis University of Minnesota Press, 1948. Pp. ix, 204. $3.00.

This book is a welcome addition to the group of studies dealing with the development, aspirations and activities of the farmers' movement in Western Canada. It is a factual, well documented

statement of the conditions that led farmers' organizations into the field of politics and of their experiences in active politics.

According to the author "this book analyses the close relationship of the Western Canadian farmers' movements to similar organizations in the contiguous wheat belt of the American Northwest as illustrative of the larger concept." The author draws upon the early history of Western Canadian land settlement and relates the conditions encountered there to conditions that existed in the American Northwest to suggest the parallelism of conditions causing farmers in Western Canada to react in a similar fashion to farmers in the United States. These conditions, geographic and economic, include similarities in the natural factors influencing farming; the economic problems of tariffs; unsatisfactory grain marketing regulations and facilities; absorbent freight rates; and problems in farm credit. The abuses that Western Canadian farmers encountered as a result of these economic factors drove them to organize to improve their position. The farmers' organizations in Western Canada followed a pattern similar to those previously experienced in the United States partly because of the similarity in underlying causes and partly because of the organizational experience of many of the new settlers in Western Canada who originated in the United States.

The major concern of Western farmers was with grain marketing legislation and with the tariffs. This led them to the conclusion that their ills can be cured through legislative action. Direct legislation was proposed as the means whereby political democracy could be achieved and which will enable farmers to correct their grievances. But this was abandoned for the more direct method of a farmers' political party. Despite opposition from individual farm leaders to this action the revolt against 'vested interests' or 'the New Feudalism' of the East finally manifested itself in the Progressive Movement. This movement, organized as an active political party on a national level, was supported by Western farmers and elected a total of sixty-five members to the federal parliament in 1921 holding the balance of power during the life of that parliament.

The 'Progressive' party, and the contributions it made towards improving the farmers' lot as well as some of the shortcomings of the farmers' political movement which led to the disintegration of the Progressive party receive considerable attention from Professor Sharp in the final chapters of the book. Although the farmers'

political movement was destroyed, the spirit that created it still lives on and finds expression through the newer third parties such as the Cooperative Commonwealth Federation and Social Credit.

Professor Sharp presents a good factual account of the activities of farmers' organizations leading up to the agrarian revolt in Western Canada. He also analyzes the forces responsible for the development of the desire for direct political action by the farmers in the West. In reading the book, however, one is left with a feeling that the influence in the Canadian movement of the American settler and his experiences in farm organization is over-emphasized. The American influence was important in the Province of Alberta but it is difficult to follow its significance insofar as Saskatchewan and Manitoba are concerned. Neither the personalities nor the organizations in these two Provinces reflect any significant American influence. The story would have been more complete if greater attention were given to the part played by the grain growers associations in these Provinces.

Western Canadian farmers organized originally to obtain more satisfactory treatment in the handling and marketing of their grain. Later they rallied behind their organizations to oppose the high tariff policy of the federal government. It was their opposition to the tariff that provided the greatest stimulus for political action. The influence of the grain growers organizations has continued to be important in Canadian agricultural history. Their strength is reflected in their large grain handling agencies and in the presence of a government directed Wheat Board, both peculiar to Canada.

To this reviewer the most important feature of Professor Sharp's book lies in its presentation of the historical facts in their relationship to the agricultural progress and policies as found at the time. The occurance of events and their effect upon the farm organizations should serve as guides to present day farm leaders. History has a tendency to repeat itself and we will do well to observe past events. Identical situations to those experienced by the earlier farmers of Western Canada appear on the current scene. The early experiences such as the question of farmer-labour cooperation, the refusal of the Manitoba legislature to support the Wheat Board plan in 1923, the clash of personalities and opinions among farm leaders and farm groups, all have a counterpart in current situations on the agricultural front. A careful study of the results should assist greatly in dealing with the current situations.

The causes for the rise and fall of the various farm organizations and the personalities associated with them receive considerable attention from the author. This touches upon the human factor in rural organization and provides the rural sociologist with a "teeing-off" place for further study. It is a phase which has received very little attention so far.

The agricultural economists finds much food for thought in the experiences of the early farm movements in Western Canada as related in this book. It supports the opinion expressed by Professor Easterbrook in his "Farm Credit in Canada" and Professor Fowke in his "Canadian Agricultural Policy" that agricultural policy in Canada was designed to assist agriculture *not for itself* but as an aid to commerce and industry. It also suggests by implication that legislation cannot provide the full answer to the farmer's economic problems. It places the onus on the economist to supply satisfactory answers to the economic problems of agriculture at the same time provides him with evidence as to the failings of political action as a panacea to the economic ills of the farmer.

This book is well written and should be read by all those concerned with the welfare of farmers in Western Canada.

SOL SINCLAIR

University of Manitoba

The Bright Tobacco Industry, 1860–1929, Nannie May Tilley. Chapel Hill: University of North Carolina Press, 1948. Pp xiv, 754. $8.00.

This book is an interesting and enlightening history of one type of tobacco—a crop which has been an integral part of American civilization since early settlers used it to pay sea captains for bringing from Europe to America the girls who were to become their wives. Most fittingly the book is dedicated to "George Arents in appreciation of his great library on the literature and history of tobacco." Perhaps the Arents library was used extensively in its preparation. At least it reflects the library experience of the author who formerly was Director of the Manuscript Department of the Duke University Library, and now is Professor of History at the East Texas State Teachers College.

Part I, of 200 pages is titled "Cultivation"; Part II, of nearly 300 pages, is headed "Marketing" and Part III, "Manufacturing,"

covers 150 pages, followed by 70 pages of Appendices of unusual materials.

Part I is a detailed account of the "Quest for Yellow Tobacco" through the media of soil, variety, fertilizers, cultural methods, and curing practices. The search began in the days of John Rolfe, in Jamestown about 1612, when seed of the Spanish variety *Nicotiana tabacum* was imported from Trinidad, off the coast of South America. Efforts to produce brighter and more mild smoking tobacco apparently have continued for more than a century and a quarter as Burley farmers in Kentucky and Tennessee still are striving to increase the proportion of smoking grades in their crops.

The importance of soil in the production of tobacco is well presented and the nitrogen starvation essential to the production of yellow tobacco is illustrated in the value of the poorer and sandy soils in growing tobacco. "Possession of a poor siliceous soil came to represent prosperity, and the same booming period witnessed the ridiculous spectacle of a controversy between counties as to which could show the greatest area of poor land" (p. 135).

The spread of Bright Tobacco into new territory is presented dramatically with reports of exploitation by fertilizer salesmen, promotors for special barn equipment or curing methods, and of successful farmers who enjoyed the prestige of relating their methods to interested new growers. Low prices for cotton and unusually high prices for the best crops of tobacco, which others sought to attain, are given much credit for the expansion of Bright Tobacco into more and more areas.

Trial and error by farmers are given more credit than scientific efforts by tobacco experiment stations for improving cultural and curing methods, altho government action in clearing up dishonest practices among fertilizer manufacturers is recognized. (p. 172 and 159).

Part II gives a history of the looseleaf auction sale of tobacco known as the "Danville System", which apparently started soon after 1850 but did not gain prominence until about 1870. Baskets were first used in 1879. Previously tobacco was piled on the warehouse floor.

The rise and fall of leaf dealers, together with the place of warehousemen and the rehandling trade, are recounted in chapters 7 and 8. Chapter 10, "Reaction to Prices", gives a running account

of early farmer movements to improve their market for tobacco through the Grange, The Farmer's Alliance and the Farmer's Union, while the extensive effort of the Tri-State Tobacco Growers' Cooperative Association is reserved for Chapter 11.

An enormous number of details are given throughout the book with seldom less than three or four footnote references on each page, yet the smooth running style maintained by the author makes it read like a "Gone with the Wind", which it resembles in size. Miss Tilley's method of selecting a few outstanding characters to represent each activity in her tobacco history, does much to add to its readability.

Part III recounts the early manufacturing processes, which depended largely on hand labor, for plug, smoking and cigarette tobaccos. The gradual adaptation of machines to tobacco manufacture, the efforts to keep the processes secret, and the competition between companies all are presented.

In tracing the origin of the cigarette, which of course is of great importance to Bright Tobacco, page 504 points out that it was "found in South America, where the Aztec style of smoking was immediately adopted by the Spanish. After a period . . . in Europe . . . the cigarette entered the United States often via Egypt or Turkey . . . . Accordingly the belief became prevalent that cigarettes had originated in Egypt or Turkey".

The growth of the American Tobacco Company and its domination of the trade is given a personal touch by relating the experiences of individual leaf dealers and small manufacturers. The end result usually was the same and James B. Duke and his company became masters of the tobacco industry.

Although the title of this book carries the dates 1860–1929, many accounts are given of earlier developments, especially back to 1837, while the opening chapter is dated 1606–1865. A few references to later developments also are made as on page 298 where the warehousemen in 1944 continued to support the auction system.

While Miss Tilley, in the preparation of this book, leaned heavily on a relatively few sources, the more than 2100 footnote references offer a wealth of source material for research workers. A 17 page bibliography also is included. The book itself is well indexed and forms a monumental addition to the literature on tobacco.

DANA G. CARD

University of Kentucky

Agricultural Economics of Bengal, Part 1, Parimalkumar Ray, Calcutta: The University of Calcutta, 1947. Pp. xxii. 235. Rs. 8 or 12s.

This book is Part I of a two volume work on the rural economy of the Province of Bengal, India. It contains four chapters: Chapter I, Physical Characteristics; Chapter II, Utilization of the Land; Chapter III, Population; and Chapter IV, Land System. Part II, which will be published later, will contain ten chapters under the following headings: Farm Organization, Agricultural Products, Agricultural Means and Methods, Communications, Agricultural Marketing, Agricultural Indebtedness, Agricultural Finance, Agricultural Cooperation, Agricultural Insurance, and Agricultural Education.

This distribution of subject matter suggests that the present work is intended as background material for a more extensive volume which is to follow. It also suggests the desirability of a single volume rather than a two volume work. A single review of the completed work would be more useful to those who may be or should be interested in it than two separate reviews. However, this reviewer is not in position to take issue with the author when he says, "In view of the importance of the book in the present circumstances I have been advised . . . to hasten its publication". (p. ix).

In the chapter on Physical Characteristics, Professor Ray discusses the area, location, temperature, rainfall, river systems, and soils of Bengal. This province, which is about 50 per cent larger than the state of Iowa, is located in the eastern part of India, extending from the Himalayan ranges in the north to the Bay of Bengal in the south. The greater part of the land surface has been formed in the course of thousands of years by the soil deposits of the Ganges and the Brahmaputra rivers. It is largely a low flat plain with high hills to the east and west and mountains to the north. Although about two thirds of the area is in the North Temperate Zone and only one third in the Tropical Zone, the climate is generally considered to be tropical. The greater part of the province receives an annual rainfall of between 40 and 80 inches, but in the east and north it exceeds 80 inches. The detailed treatment of the river systems is one of the chief contributions of this volume. It is apparent that the rivers will continue to play an exceedingly important role in developments which are envisaged for the future.

The need for more accurate and complete statistics is apparent in the next two chapters on Utilization of the Land, and Population. On the basis of the available data, it appears that nearly one half of the land area is under cultivation at present, and the author concludes that about two thirds of the total area is suitable for cultivation (p. 79). Thus, the proportion suitable for cultivation in Bengal is much higher than in most parts of the world. This is due to a fortuitous combination of suitable soil, topography, temperature, and rainfall. The principal crop is rice which is grown on over 72 percent of the cultivated area. Jute, which ranks second from the standpoint of land use, is grown on about 11 percent of the cultivated area.

Bengal has a total population in excess of sixty million (p. 86), of which nearly 93 percent is rural and only a little over 7 percent urban (p. 117). According to Professor Ray, the most pressing population problems include: a high birth rate, high death rate especially high infant and maternal mortality, absence of balance in the economic life of the people, low income per capita, poor nutrition, inadequate public health services, and illiteracy. He adds " . . . almost half of those born alive find themselves in graves before the age of 10 is reached. . . . By the time the age of 40 is reached, more than four fifths are already out of this world's drama . . . ." (p. 171).

With respect to population density, Professor Ray states that India clearly is overpopulated relative to the present food supply or the command over food supply. But if judged by "total area or by potential resources, India, including Bengal, cannot be said to be overpopulated." Looking to the future, however, he concludes that there is urgent need of " . . . control of population growth by preventitive checks" (p. 183). The emphasis he places on population control will strike a responsive chord in the hearts of many who would like to contribute to the wellbeing of the people of India but feel that little of a permanent nature can be done until the population problem is brought under some measure of control.

Another important contribution of this volume is to be found in the chapter on Land System. The author sketches the historical background of the Hindu and Mohammedan land systems and explains the relationship of the individual and of the state to landed property under each. He states that the British" . . . were apparently ignorant of the ideas of property rights that had been recog-

nized throughout the Hindu period and were but little altered in the Mohammedan period" (p. 202). As a result, various measures were introduced by the British which were not adapted to Indian conditions. Land economists and others will be quick to agree that a thorough understanding of past and present tenure arrangements are essential to the formulation of a sound tenure program in any given country. They will, however, look for a more complete statement of existing tenure arrangements in Bengal than is to be found in this volume. Perhaps such a statement will be forthcoming in the volume which is to follow.

AUSTIN A. DOWELL

University of Minnesota

Economics, an Introductory Analysis, Paul A. Samuelson. (New York: McGraw-Hill Company, 1948.) Pp. xx, 622. $4.50.

"This book is written primarily as a textbook for those who will never take more than one or two semesters of economics but are interested in the subject as part of a general education. It aims at an understanding of the economic institutions and problems of American civilization in the middle of the twentieth century. National income provides the central unifying theme of the book." There can be little doubt that this book will be widely used for its stated primary purpose. In fact, it would be surprising if it does not attain a much wider clientele.

In format and general organization this text is superior. It has throughout an attractive, animated appearance which is of some importance in an age of increasing distractions. Organizationally it is divided into three major divisions which will be separately reviewed below. The intra-chapter organization is explicit and most chapters have useful terminal summaries. From a pedagogical point of view it is a relatively efficient textbook.

The subject matter is arranged according to the following major topics: Part one, (250 pp.) Basic Economic Concepts and National Income; Part two, (190 pp.) Determination of the National Income and Its Fluctuations and Part three, (160 pp.) The Composition and Pricing of National Output.

Part one consists largely of orienting, familiarizing and motivating material. In addition, it contains much relevant economic data, drawing heavily on recent significant research. Most of the topics presented in Part one are to be found in the majority of ele-

mentary texts. The incorporated innovations consist primarily in topic weighting and arrangement. The topic progression is briefly: central problems, structure and function of the economy, personal income experience, business organization, the economic role of government, labor organization, personal finance, and national income. Special mention should be made of the fact that in Chapter 10 the household consumption and savings functions are introduced together with the related marginal propensities and that in Chapter 11 the various national income concepts are developed in an unusually articulate fashion. Professor Samuelson is not the first to incorporate these topics into a beginning text, but the lucidity with which he unfolds them is likely to contribute much to their further inclusion in elementary courses.

Part one and to a lesser extent the entire book are marred, among other things, by more than occasional dogmatism, looseness of expression and by frequent use of technical terminology before it has become meaningful to the student, but these do not offset the general high quality of Part one or of the text as a whole.

Part two, Determination of National Income and its Fluctuations, constitutes the *piece de resistance* as well as the motif of this text. It begins with an excellent chapter on the theory of aggregate income determination and then treats in integrated order: the general price level, money and interest rates, the functioning of the monetary-banking system, Federal Reserve monetary policy, international finance, and domestic employment, the business cycle and fiscal policy and full employment without inflation. In short a compact exposition of the essentials of aggregative economic analysis.

Part two is replete with relevance. It should require an unimaginative instructor indeed to neutralize the stimulating impact of this section on the general student. In addition to the nature of the content, which again is not unique among elementary texts, the exposition is unusually lucid while concomitantly remaining on a high analytical plane. The basic concepts of macroeconomic analysis are presented verbally, by numerical examples and by the best graphic development of these that I have yet encountered in a basic text.

Part three; The Composition and Pricing of National Output, consists primarily of a premeditatedly terse treatment of value theory, Chamberlinian in orientation and a short rejection of

orthodox distribution theory. It then concludes with chapters on topics like international trade and tariffs, dynamics, and competing economic systems.

Professor Samuelson states at the outset that he has reduced to more appropriate emphasis the conventional marginal analysis of value and distribution theory. In a sense, the problem of emphasis is a matter of judgment and must be largely decided by the individual instructor. There are no doubt many who will agree with Professor Samuelson's topic weighting and selection. Perhaps calling early attention to some of the major gaps in economic theory will stimulate accelerated exploration of these areas.

Leaving aside the question of topic weighting the reviewer still feels that in spite of the modernity of the approach and the current quality of the tools of analysis presented that this is the weakest section of the text. Unless fairly richly supplemented, the student will fail to experience a balanced comprehension of the microeconomic aspects of the economy. Of course, this material is available in a large number of other texts and, in fact, as presented by Professor Samuelson for the purpose he has in mind in combination with parts one and two provides an excellent instructional entity.

Examination of postwar introductory economics texts will reveal that the majority of them and presumably a large number of principles courses as well continue to ignore or to give relatively perfunctory or abbreviated attention to aggregative economic analysis. There have been an encouragingly increasing number of exceptions, however. This development can scarcely be considered either premature or radical since much of the vocabulary and many of the concepts of macroeconomic analysis have long since reached the cliché stage in the popular press.

Many economics instructors will recall the apathy and impatience with which many superior and other students reacted to the preoccupation of many depression decade courses with the problems of relative pricing and efficient resource allocation during a period in which the problem of resource unemployment was all-pervasive. There is some evidence that a "perverse" course-content may be continuing; that during protracted periods of "full" employment the problem of economic efficiency in turn may be understated.

Probably above all other attributes of the economy and of

economics, evolution is paramount. It is therefore important to instill in a student the realization that continuous current study is prerequisite to continuous economic literacy. From a thorough study of this book the intelligent student should gain that impression as well as a relatively high level of analytical ability. Many academic economists who do not regularly contact elementary students of economics may be interested in observing the extent of recent change in elementary course-content.

ARNOLD BREKKE

University of California

Adam Smith Today: The Wealth of Nations, Simplified, Shortened, and Modernized, Arthur Hugh Jenkins. New York: Richard R. Smith, 1948. Pp. 480. $5.00.

In the words of the flyleaf: "It is difficult to classify this work; it is not a re-editing, nor a paraphrase, nor an abridgement, but something of all three." It is evidently the editor's, paraphraser's, or abridger's intention to produce the bulk of the *Wealth of Nations* in a form which will induce the average American to read it. The language of Adam Smith is modified enough to render the style a most peculiar mixture of eighteenth and twentieth century idiom. Enough re-arrangement has been done to make several awkward forward references necessary—thus Adam Smith's Books 4 and 5 have been transposed, for no very good reason that the reviewer can perceive, and there is a sufficient amount of re-arrangement of chapters and sections of chapters so that it is not always easy to trace the passages abridged or paraphrased. Occasional gems that happen to have caught the editor's fancy have been reproduced in Adam Smith's own language. All in all, this reviewer much prefers Adam Smith's incomparable original to this curious melange; however, there may be some readers for whom Mr. Jenkins' arrangement will prove the key to another realm of gold.

There is great need for a new edition of Adam Smith, and indeed of all the classics, in the light of the profound changes which have taken place in economics in the past generation—changes of which Mr. Jenkins is only dimly aware (I cannot find any author later than Carver cited in the footnotes, and Thorold Rogers seems to be his principal authority)—and towards which his introduction reveals him to be thoroughly hostile. Unfortunately, the present volume does not even begin to satisfy that need. It is doubtful

whether Mr. Jenkins' version is even easier to understand than the original. Thus Book 2 Chapter 2—perhaps at once the most suggestive, fruitful, and misleading of all Adam Smith's chapters—which in the original is headed "Money considered as a particular branch of the general stock" is headed by Mr. Jenkins' "Money not capital"—the very opposite of what Adam Smith is trying to say.

Mr. Jenkins' labors seem to have been partly a labor of love, partly an attempt to use the authority of Adam Smith to reassure himself in his political views. There seems to be little reason why his labors should not have rested happily in manuscript form.

K. E. BOULDING

Iowa State College

PUBLICATIONS RECEIVED

Abramovitz, Moses, "The Role of Inventories in Business Cycles" Occasional Paper 26, New York: National Bureau of Economic Research, 1948. Pp. 26. $.50.

Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture, "How Families Use Their Income" Miscellaneous Publication No. 653, Washington, 1947. Pp. 64.

DeGraff, H., and Haystead, L., "The Business of Farming" Norman: University of Oklahoma Press, 1948. Pp. xviii, 244. $3.00.

Department of Economic Affairs, United Nations, "Economic Report": Salient Features of the World Economic Situation, 1945–47: Lake Success, 1948. Pp. xv, 354.

Department of State, "Second Report to Congress on the United States Foreign Aid Program" Economic Cooperation Series 8, Washington: Government Printing Office, 1948. Pp. vi, 138. $.35.

Ellis, H. S., Editor, "A Survey of Contemporary Economics," 1948. Philadelphia: The Blakiston Company, 1948. Pp. xv, 490. $4.75.

Hanna, F. A., Pechman, J. A., and Lerner, S. M., "Analysis of Wisconsin Income," Studies in Income and Wealth, Vol. 9, New York: National Bureau of Economic Research, 1948. Pp. xviii, 261. $3.50.

Jenkins, Arthur, "Adam Smith—Today, The Wealth of Nations," New York: Richard R. Smith Company, 1948. Pp. vii, 480. $5.00.

Kile, O. M., "The Farm Bureau Through Three Decades," Baltimore: Waverly Press. 1948. Pp. ix, 416. $3.50.

Landis, Paul H., "Rural Life in Process," Second Edition, New York: McGraw-Hill Book Company, 1948. Pp. xix, 538. $4.00.

Mills, F. C., "The Structure of Postwar Prices" Occasional Paper 27, New York: National Bureau of Economic Research, 1948. Pp. 66. $.75.

Nelson, Lowry, "Rural Sociology," New York: American Book Company, 1948. Pp. xvi, 567. $4.25.

Nicholls, W. H., "Labor Productivity Functions in Meat Packing," Chicago: University of Chicago Press, 1948. Pp. xvii, 256. $5.00.

Research and Policy Committee of the Committee for Economic Development, "Taxes and the Budget: A Program for Prosperity in a Free Economy," New York, 1948. Pp. 79. $.25.

Taylor, Philip E., "The Economics of Public Finance," 1948. New York: The Macmillan Company. Pp. xxii, 617. $4.50.

Whetten, Nathan L., "Rural Mexico," Chicago: University of Chicago Press. 1948. Pp. xxv, 671. $10.00.

BOOKS CONTRIBUTED TO THE AMERICAN FARM ECONOMIC ASSOCIATION LIBRARY

October 1, 1948

American Society of Agronomy and National Fertilizer Association. *Hunger Signs in Crops, A Symposium.* Washington, D. C. Judd and Detweiler. 1941. 327 pages. (Contributed by Charles J. Brand.)

Philadelphia Society for Promoting Agriculture. *Memoirs,* Vol. VI. Philadelphia, July 1939. 229 pages.

Renne, Roland R. *Land Economics.* New York, Harper and Brothers, 1947. 725 pages.

Robinson, James L. *Farm Credit.* Circulars prepared for the Farm Credit Administration, Division of Information and Extension, Washington, D. C. 1939–1946.

Methods and Information on Farm Credit Education, Farm Credit Administration and Extension Service pamphlets prepared in part by James L. Robinson. Washington, D. C. 1935–1947.

Hopkins, John A. *Elements of Farm Management.* New York, Prentice-Hall, Inc., 1947. 524 pages.

Farm Records. Ames, Iowa State College Press, 1942. 258 pages.

NEWS ITEMS

Steps are being taken to expand the teaching and research program in statistics at Cornell University. Professors J. E. Morton and P. J. McCarthy of the School of Industrial and Labor Relations are offering additional courses for students in the social sciences including a seminar in economic statistics. Professor W. T. Federer, formerly of Iowa State College and the Statistical Laboratory at Ames, has recently joined the staff of the College of Agriculture. He will teach, do research, and consult on statistical problems in the biological sciences but will also be available for consultation on statistical problems in other fields including Agricultural Economics. Professors William Feller and Mark Kac in the Department of Mathematics are offering courses in statistics and probability. The Mathematics Department is also offering a special course in mathematics for students in the social and biological sciences.

Norris J. Anderson, Professor of Agricultural Economics, Kansas State College, is on leave for graduate study in agricultural economics at the University of Minnesota.

S. W. Atkins, Agricultural Economics, Bureau of Agricultural Economics, who has been working in cooperation with the Tennessee Agricultural Experiment Station, has been transferred to a cooperative project with the Tennessee Valley Authority. His headquarters will remain in Knoxville.

William B. Back has returned to the Farm Economics staff of the Experiment Station, University of Kentucky, after spending 15 months at the University of Chicago and Iowa State College where he was engaged in further graduate studies.

Raymond Beneke has been appointed assistant professor at Iowa State College. Mr. Beneke, who has been doing graduate work at the University of Minnesota, will be engaged in teaching and research in the fields of farm management and production economics.

Russell L. Berry has been appointed Assistant Professor of Agricultural Economics at Kansas State College. He will teach and conduct research in Land Economics in the absence of Professor Norris J. Anderson.

Charles E. Bishop, Assistant in Farm Management in the College of Agriculture, University of Kentucky, is on a year's leave of absence to engage in graduate studies at the University of Chicago.

Lawrence L. Boger has been appointed Instructor in Economics (Agricultural) at Michigan State College.

Miss Mary M. Bodwell, formerly Home Demonstration Agent in Missouri, joined the Agricultural Economics Extension staff as Assistant Professor on September 15, 1948. She will be concerned with the utilization phases of the R.M.A. Consumer Education Project of the Department.

Furman P. Bowers has been appointed Instructor in Agricultural Economics at the University of Tennessee.

James O. Bray has joined the Agricultural Economic staff at Purdue University as an Instructor in Farm Management. He was formerly a graduate assistant in Agricultural Economics at Purdue.

R. G. Bressler, Jr. left the University of Connecticut in July to accept a position in milk marketing research with the Department of Agricultural Economics, University of California, Berkeley.

H. M. Brewer, in charge of the agricultural statistician's office of the Bureau of Agricultural Economics at the University of Maryland, has transferred to the Washington staff of the Bureau. J. H. Peters, a member of the Washington staff, succeeds Mr. Brewer in charge of the office in College Park.

George A. Brinegar, who has been pursuing his graduate studies at the University of Chicago since the spring of 1946, has been appointed Assistant Professor in the Department of Agricultural Economics at the University of Connecticut.

D. A. Broadbent, Associate Professor in the Department of Agricultural Economics, Utah State Agricultural College, has been appointed as Assistant Director of Utah Agricultural Experiment Station. His assignment is fifty percent to the Experiment Station and fifty percent to research in the Department of Agricultural Economics.

O. H. Brownlee has been appointed Assistant Professor in the Department of Economics, the University of Chicago. Mr. Brownlee was formerly a member of the faculties of Iowa State College and of the Carnegie Institute of Technology.

Richard Butler has joined the staff of the Bureau of Agricultural Economics. He is currently working on the food consumption project.

George B. Byers of the University of Kentucky received his Ph.D. degree in August 1948 from Iowa State College.

Alvin G. Carpenter, Extension Economist, Utah Agricultural Extension Service, has been made the Assistant Director of the Extension Service for Utah.

Fred A. Clarenbach of the Department of Political Science of the University of Wisconsin spent the summer months in Washington, D. C., assisting the Bureau of Agricultural Economics on a study of problems involved in benefit-cost analysis.

Harold B. Clark has been appointed as Assistant Economist in Agricultural Marketing in the Departments of Markets and Rural Finance at the University of Kentucky.

Albert J. Cross began duties August 1 with the Division of Farm Management and Costs, Bureau of Agricultural Economics. He is stationed at Urbana, Illinois on a cooperative project with the Illinois Agricultural Experiment Station.

Lee M. Day has been appointed an Instructor in the Division of Agricultural Economics at the University of Minnesota. Mr. Day was formerly on the staff at Iowa State College.

Howard G. Diesslin has joined the Agricultural Economics staff at Purdue University as an Instructor in Agricultural Finance.

George C. Edler, specialist in seeds of the Bureau of Agricultural Economics, has returned to the United States from a two months' trip to Europe. The assignment was carried out under the Research and Marketing Act program for the Office of Foreign Agricultural Relations.

Joseph A. Ewing, of the agricultural estimates staff of the Bureau of Agricultural Economics, has transferred to the agricultural estimates office in Springfield, Illinois.

George Frick, formerly associated with the University of Connecticut, has accepted an appointment with the Bureau of Agricultural Economics, and will be stationed at Durham, New Hampshire.

H. Prentiss Gazaway has been appointed Assistant Professor of Rural Economics in the Department of Economics, Sociology and History at the Colorado A. & M. College.

C. G. Garman, formerly with F.C.A. and more recently farming, will return to Cornell this winter to teach and assist in the preparation of Extension bulletins.

Robert Glasgow, a member of the staff of the Bureau of Agricultural Economics, has returned to Harvard for his second winter of work.

Frank D. Hansing, formerly on the Agricultural Economics staff, University of Illinois, is now employed by the Division of Land Economics, and is stationed at the Virginia Agricultural Experiment Station, Blacksburg, Virginia.

Clifford M. Hardin has been appointed Assistant Director of the Michigan Agricultural Experiment Station. He was formerly Professor of Agricultural Economics and Chairman of the Agricultural Economics Section of the Department, Michigan State College.

Dale E. Hathaway has been appointed instructor in extension, Michigan State College.

R. C. Headington has accepted an appointment to the faculty of Arizona State College.

Carl Heisig, Head of the Division of Farm Management and Costs of the Bureau of Agricultural Economics, sailed late in August for a three-month stay in Brazil. Mr. Heisig is a member of an eight-man committee which was set up to advise and assist a three-man commission from the United States that will collaborate with a similar Brazilian group in evaluating possibilities of the economic development of that country.

Peter L. Henderson has been appointed to the temporary position of Assistant Professor of Agricultural Economics of the University of Georgia.

Walter A. Hendricks, in charge of the statistical methodology work in the Bureau of Agricultural Economics, left the middle of September for the American Zone of Germany, where he will complete the analysis of results obtained from an objective survey of crop production. The survey itself was planned by Mr. Hendricks and Paul Koenig, also of the Bureau of Agricultural Economics, both of whom were in Germany during the late spring and early summer. Mr. Hendricks will return to the Bureau about the first of November.

Clifford G. Hildreth has been promoted from assistant professor to associate professor at the Iowa State College.

Lorraine Houlihan has joined the staff of the Department of Agricultural Economics at Cornell as Assistant Professor of Food Marketing. This is another joint effort of the Colleges of Agriculture and Home Economics at Cornell.

Starley Hunter, who obtained her Ph.D. degree at Purdue University in August, 1948 with a major in Consumption Economics, has become head of the Home Economics Department in the School of Agriculture at the University of Missouri.

George A. Jackson, Jr., formerly on the Agricultural Experiment Station staff, University of Illinois, has accepted a cooperative appointment with the University of California and the Bureau of Agricultural Economics to do research work on costs and margins.

Lowell Jackson, formerly Superintendent of University owned farms at Nebraska, has been appointed Assistant in Rural Economics in the Experiment Station.

Ronald W. Jones has returned to the Bureau of Agricultural Economics from a year of study at the University of Chicago. He is currently working on the problem of how best to classify farms.

Donald R. Kaldor has been promoted from assistant professor to associate professor at the Iowa State College.

Willys Knight has been appointed Assistant Professor in teaching and research in Agricultural Economics, Michigan State College. Mr. Knight received his Ph.D. degree from the University of Maryland this summer.

Robert C. Kramer has accepted appointment as Instructor in research, Michigan Agricultural Experiment Station.

A. A. Kreig accepted a position in the Commercial Research Department of Swift and Company upon completion of his master's degree in Agricultural Economics at the University of Illinois during the summer of 1948.

Maxwell I. Klayman has returned to the Bureau of Agricultural Economics from the Division of Productivity and Technological Trends of the Bureau of Labor Statistics. He is currently engaged in research on sugar.

George Eric Lamming, a graduate of the University of Nottingham, England, has been granted a fellowship by the Graduate School, University of Illinois, to do graduate study in agricultural economics.

Henry Larzelere has taken leave of absence for three months from Michigan State College to work with the Poultry Branch, P.M.A. While there, he will prepare the regional summary of the study of egg grading and quality deterioration in shipment for the North Central Region.

Jeanne Lear is now on the statistical and historical research staff of the Bureau of Agricultural Economics. She is currently working on size distribution of farm income.

E. H. Matzen resigned from his position at the University of Missouri on October 15.

Lee Roy Martin, Agricultural Economist, Dairy Branch, P.M.A., will join the research staff of the Department of Agricultural Economics at N. C. State College October 1, 1948. He will be in charge of tobacco marketing research.

William E. McDaniel has been appointed an Instructor in the Division of Agricultural Economics at the University of Minnesota.

Frank Miller has been promoted from Assistant Professor to Associate Professor of Rural Economics at the University of Nebraska.

Professor E. G. Misner has returned to the Department of Agricultural Economics at Cornell after an extended illness.

George Montgomery, Head of the Department of Economics and Sociology, Kansas State College, is on leave for graduate study in agricultural economics at the University of Minnesota. Dr. J. A. Hodges is Acting Head of the Department in the absence of Professor Montgomery.

George Motts has transferred from a teaching-research position in agricultural economics to an extension position at Michigan State College. He will work on a new extension project in consumer education, primarily in reference to fruits and vegetables.

Albert L. Owens is on leave of absence from his position with the Rhode Island Agricultural Experiment Station to do graduate work in the Department of Agricultural Economics, University of Illinois.

William R. Parks has resigned from the Bureau of Agricultural Economics to accept a position in the Political Science Department of Iowa State College.

Clarence E. Pike has accepted a position with the Farm Credit Administration in Washington, D. C.

Paul L. Putnam has returned to full-time work as Professor of Farm Management at the University of Connecticut after five years' work as State Farm Labor Supervisor.

C. Brice Ratchford is on leave of absence under a General Education Board Fellowship. Mr. Ratchford will pursue graduate work at Duke University.

Franklin J. Reiss of the Department of Agricultural Economics, University of Illinois, joined the field staff of the Division of Farm Management and Costs, Bureau of Agricultural Economics. Through cooperative arrangements with the University of Illinois, Mr. Reiss will study the effect of managerial ability upon a farm's operations, costs and returns.

Leonard H. Rhodes, formerly with the Office of Inter-American Affairs, has transferred to the Washington office of the Bureau of Agricultural Economics.

Kenneth L. Robinson has been awarded the Elmhirst Studentship for advanced study in agricultural economics at Oxford University for the academic year 1948–49. Mr. Robinson graduated from Oregon State College in 1942. After service in the army, he entered the Graduate School at Cornell University receiving the master's degree in Agricultural Economics in September 1947. During the past year he has been doing graduate work in Agricultural Economics at Harvard. The summers of 1947 and 1948 were spent as research assistant with the National Bureau of Economic Research. After a year at Oxford, Mr. Robinson expects to return to Harvard to complete requirements for the Ph.D. degree. Mr. Robinson is the first student to be elected to the Elmhirst Studentship. Additional awards will be made for the academic years 1949–50 and 1950–51.

George A. Rogers, formerly assistant director of the Fruit and Vegetable Department, American Farm Bureau Federation, has joined the staff of the Bureau of Agricultural Economics.

Fred R. Robertson has joined the staff of the Agricultural Relations Division, Tennessee Valley Authority.

Olav Rogeness, formerly with the Bureau of Agricultural Economics is Assistant Rural Economist at the University of Nebraska.

Anthony S. Rojko, recently at the University of Connecticut, has accepted a joint appointment with the University of Massachusetts and the B.A.E. on a dairy research project and will be stationed at the Research Council Office in Boston.

Waldo S. Rowan, Assistant Professor of Agricultural Economics of the University of Georgia, has been granted leave of absence to do graduate work at the University of Wisconsin.

Robert W. Rudd has been appointed as Assistant Economist in Agricultural Marketing in the Department of Markets and Rural Finance at the University of Kentucky. Mr. Rudd formerly was a Graduate Research Assistant at Giannini Foundation of Agricultural Economics, University of California.

Charles F. Sarle, Head of the Division of Special Farm Statistics in the Bureau of Agricultural Economics, left late in September for Japan, where he is serving as a visiting expert with the Natural Resources Section, General Headquarters, Supreme Commander for the Allied Powers. Dr. Sarle's specific mission is to recommend improvements in the procedures and organization of the Japanese Crop Reporting Service. He will return to the Department of Agriculture about the middle of December.

Elmer N. Searls completed the requirements for a doctorate degree in Agricultural Economics at Cornell in September 1948. Mr. Searls has joined the staff of that institution as Assistant Professor of Marketing. He will be in charge of the extension work in milk marketing.

Grover J. Sims has transferred from the Bureau of Agricultural Economics to the Livestock Branch of the Production and Marketing Administration.

Clyde E. Stewart is on leave from the Bureau of Agricultural Economics for graduate work at Iowa State College.

Stanley K. Seaver, on sabbatical leave from the Department of Agricultural Economics at the University of Connecticut, is taking graduate work toward his doctorate at the University of Chicago this year as a fellow of the Hood Foundation.

Orlin J. Scoville, Bureau of Agricultural Economics, has been transferred to Kansas State College to conduct cooperative research in farm management.

Sidney Schmukler, formerly Assistant Professor of Agricultural Economics at the University of Connecticut, has accepted an appointment at Drake University, Des Moines, Iowa.

Richard A. Sherburne has been added to the Agricultural Economics staff at the University of Arizona.

L. G. Sleight, a graduate of Utah State Agricultural College, has been employed by the Department of Agricultural Economics, University of Illinois, to do research work on the North Central States regional potato and fruit and vegetable marketing projects.

Don Stark is on leave of absence, July 1 to December 31, 1948, from the Extension Service, Michigan State College. He is working with the Detroit Meat Packing Company and the Michigan Livestock Exchange on a program of membership relations.

Maurice C. Taylor, on leave from the faculty of the State College of Washington, will spend the 1948–49 academic year at the University of Chicago as a fellow in Agricultural Economics.

Morris Taylor has been appointed as Extension Marketing Economist at Utah State Agricultural College on the assignment of marketing of range livestock.

Lawrence W. Witt has been appointed Chairman of Agricultural Economics Section of the Economics Department at Michigan State College.

Mary B. Wood has joined the staff of the Department of Agricultural Economics at Cornell as Assistant Professor of Food Marketing.

Carlton E. Wright has been appointed Professor of Marketing at Cornell. Dr. Wright, as Instructor on the Extension staff in Agricultural Economics in 1943–44, obtained experience in food marketing for consumers. Following that he was Director of the New York State Agricultural and Technical Institute at Cobbleskill, New York, and later Director of Research and Publications for the American Vocational Association, Inc., Washington, D. C.

Norman R. Urquhart, who has been on the agricultural staff of Western Illinois State College, has accepted an appointment at the Department of Agricultural Economics, University of Illinois, on a cooperative research project with the Soil Conservation Service.

Thomas M. Venables who obtained his Ph.D. degree at Purdue University in June 1948 has gone to Germany on a two year assignment with the Food Section of the Military Government.

JOINT SESSIONS, AMERICAN ECONOMIC ASSOCIATION AND AMERICAN FARM ECONOMIC ASSOCIATION

CLEVELAND, OHIO

December 28, 30, 1948

TUESDAY, December 28

The Theory and Measurement of Price Expectations

Chairman: Mordecai Ezekiel, FAO and U. S. Department of Agriculture

Papers: Holbrook Working, Food Research Institute
Theodore W. Schultz, University of Chicago

Discussion: Kenneth E. Boulding, Iowa State College
L. J. Norton, University of Illinois
Warren C. Waite, University of Minnesota

THURSDAY, December 30

Coming Readjustments in Agriculture

Chairman: Howard R. Tolley, Food and Agriculture Organization

Papers: John D. Black, Harvard University
D. A. Fitzgerald, Economic Cooperation Administration

Discussion: T. W. Schultz, University of Chicago
T. O. Yntema, University of Chicago

WEDNESDAY, December 29

Central Topic: Agricultural Statistics—Measurement of Main Economic Magnitudes.

Place: Euclid Room, Hotel Statler

A. 10:00 A.M. to 12:00 M.

Chairman: William G. Murray, Iowa State College

1. Measurement of Agricultural Production
   Speaker: Charles F. Sarle, Bureau of Agricultural Economics
   Discussion: Clifford Hildreth, Iowa State College
2. Estimates of Agricultural Employment and Wage Rates
   Speaker: Thomas C. M. Robinson, Bureau of Agricultural Economics
   Discussion: Cladys L. Palmer, University of Pennsylvania

B. 2:00 to 4:00 P.M.

Chairman: E. J. Working, University of Illinois

3. Estimates of Prices Received and Prices Paid
   Speaker: George M. Kuznets, University of California
   Discussion: B. R. Stauber, Bureau of Agricultural Economics
4. Measurement of Farm Income and Expenditure
   Speaker: E. W. Grove, Bureau of Agricultural Economics
   Discussion: D. Gale Johnson, University of Chicago

MEETINGS OF THE EXECUTIVE COMMITTEE
SEPTEMBER 13, 14, 16, 1948

Present: Murray, Butz, Hedges, Norton, Waite, Hobson, Waugh, DeLoach, and Burton.

The Secretary-Treasurer reported on the membership and finances for the period from December 1 to September 1. The Editor reported briefly.

Mr. William H. Glover, Library-Custodian, submitted the report printed below, which was accepted.

The operations of the Special Grants Committee were discussed. The letter of Julius Hendel printed below was read and discussed. On September 14 Mr. Hendel met with the committee. The committee expressed its great appreciation of the work of Mr. Hendel and his committee. The President appointed as a Research Award Committee to develop a definite plan for the use of the Special Grants Fund and to report at the first meeting of the 1949 Executive Committee: Warren C. Waite, Joseph S. Davis, and Frederick V. Waugh, chairman.

O. B. Jesness reported progress on the book of Readings on Agricultural Policy.

Harold Hedges reported on the date and place of the 1949 annual meeting. The association has received an invitation from the Western Farm Economics Association. The Canadian Agricultural Economics Society would like to have the meeting in Canada in 1950. Our Southern members would like to have the meeting in the Southeast. After discussion it was agreed that the association should plan to hold its annual meeting in the summer and also arrange to have joint sessions with the American Economic Association and other groups during winter meetings of such associations. The following was adopted: "We recommend that the invitation of the Western Farm Economics Association for a joint meeting in 1949 be accepted, the two Executive Committees to make final determination of place and time."

Tentative dates of August 29 to September 1 were mentioned for the 1949 Annual Meeting. The American Institute of Cooperation plans to meet August 22–25.

Mr. Leonard K. Elmhirst, president of the International Conference of Agricultural Economists, reported that a meeting of the Conference would be held in 1949, probably in Italy. Tentative dates are August 28 to September 6.

Earl Butz reported on the establishment of student chapters of the AFEA. Peter Nelson, Oklahoma A and M College, I. W. Arthur, Iowa State College, and the following students sat with the committee during this discussion: Lee Roy Larkin and Robert L. Lacy, Oklahoma A and M College, John D. Elderkin, Iowa State College, and Horace Paarlberg, Purdue University. The Butz report printed below was approved. This includes the following amendment to the Constitution which was recommended for approval by the association:

"Amend Article III by adding the following: 'Student sections of the American Farm Economic Association may be authorized in colleges or

universities that offer courses in agricultural economics, farm management, or allied fields. Establishment of student sections shall be under such rules as the Executive Committee may decide.'"

The report of the Policy Committee was submitted by its chairman, Fred Waugh, and was approved. It involves two amendments to the Constitution. The Committee recommends that the present Article II be replaced by the following:

"*Objectives.* The objectives of this association shall be:

1. To encourage effective investigation and free discussion of the various topics and issues in agricultural economics.
2. To promote and maintain high standards of accomplishment in research, teaching, and extension in agricultural economics by fostering study, writing, and contacts which contribute to this end.
3. To stimulate objective analysis and discussion of existing and proposed economic policies and programs affecting the welfare of farmers or affecting the general public as consumers of food and fiber.
4. To provide a means of publication (JOURNAL OF FARM ECONOMICS) for scholarly analyses and research findings in the field, and other items of general interest to the membership.
5. To promote interest in and understanding of the profession of agricultural economics among undergraduate students in American colleges.
6. To provide a medium for effective professional cooperation between agricultural economists and scientists in other fields.
7. To solicit the interest and support of farmers, consumers, and other economic groups in the study and analysis of the economic problems of agriculture."

The following amendment to Article V of the Constitution was also recommended: "'Not later than one month before the annual meeting' be inserted in place of 'not later than December 1'." This refers to the mailing of the ballots.

It was agreed that in 1948 ballots would be mailed out by November 1 so that the officers for 1949 would be known by December 1. The fiscal year beginning in 1949 will end June 30.

The following expenditures were approved:

1. Not to exceed $100 for the Library-Custodian for additions to the archives of the association.
2. The expenses of the Executive Committee for attending an interim meeting if the 1949 President deems a meeting necessary.
3. Contribution of $25 to the American Institute of Cooperation.

The appointment of a Marketing Committee to work jointly with a committee of the American Marketing Association was approved.

The Executive Committee expressed its appreciation of the fine work of the staff and management of the Northern Baptist Association in contributing to the success of the conference.

L. J. NORTON, *Secretary-Treasurer*
W. G. MURRAY, *President*

MINUTES OF THE ANNUAL MEETING OF THE AMERICAN FARM ECONOMIC ASSOCIATION

SEPTEMBER 16, 1948

WILLIAM G. MURRAY, *presiding*

The Secretary-Treasurer gave a summary of his annual report which is appended. The Editor gave his report which is printed below. Asher Hobson commented on the work of the Library-Custodian and urged that the members send in copies of their published work. The Secretary read the report of the Chairman of the Special Grants Committee which is included in the report of the Executive Committee. Asher Hobson moved a vote of thanks to the members of the Special Grants Committee for their effective work in raising substantial funds. This motion was carried unanimously. The President announced the reappointment of the Research Award Committee to work out details for the use of these funds as stated in the report of the Executive Committee. O. B. Jesness reported "progress" on the preparation of the volume of Readings on Agricultural Policy.

Harold Hedges reported on plans for the 1949 meeting. His complete report is appended. D. B. DeLoach, president of the Western Farm Economics Association, extended an invitation from that association to the AFEA for a joint meeting in 1949. The Secretary reported the recommendation of the Executive Committee as stated in its report. R. E. Proctor of Georgia and G. W. Forster of North Carolina invited the association to hold its annual meeting in 1949 at Mt. Treat, North Carolina. J. F. Booth and W. M. Drummond reported that the Canadian Agricultural Economics Society would be glad to have the association hold an annual meeting at the Ontario Agricultural College at Guelph in Canada. Norman Nybroten moved that alternatives be submitted to the total membership for an advisory vote. This motion was made and lost. The recommendation of the Executive Committee was then approved by the group. The Secretary advised that he would submit an advisory ballot to the complete membership as to their wishes with respect to the 1950 meeting at the time of the annual election.

E. L. Butz reported on the establishment of student chapters of the AFEA. The report was approved. The Secretary read the amendment relating thereto as stated in the Executive Committee report and moved that it be adopted. The motion carried. The report is appended.

F. V. Waugh read the report of the Policy Committee which is appended. The report was approved. The Secretary read the amendment to Article II of the Constitution as set forth in the Executive Committee report and moved its adoption. The amendment was adopted.

The Secretary then moved the change in Article V of the Constitution set forth in the Executive Committee report and moved its adoption. It was adopted. Three items of special expenditures as set forth in the Executive Committee report were approved.

R. J. Eggert read the report of the Marketing Committee signed by Leland Spencer. The President announced that he would appoint a committee which would be authorized to work jointly with a committee of the American Marketing Association. The report is appended.

Asher Hobson offered the following resolution which was adopted: "This is the second year the American Farm Economic Association has enjoyed the privileges of guests of the Northern Baptist Assembly. We liked the experience last year, and we like it this year. The Association takes this means of expressing our sincere appreciation of the many and varied efforts of the management and members of the staff which combine in creating a pleasant home for those participating in these meetings. We have enjoyed our four days at Green Lake, and we hope some day to come back."

The Secretary offered the following resolution which was adopted: "We express our appreciation to Mr. Milton Button, Director of the Wisconsin Department of Agriculture, and to the Department for the cheese which we had at dinner the evening of September 15. It was particularly fitting that the many visitors to Wisconsin at our meeting should have an opportunity to sample that famous Wisconsin product—natural aged, American cheese."

The Secretary moved a vote of appreciation for the excellent work of the President during the past year. The motion was enthusiastically approved.

The President appointed G. W. Forster, R. E. Proctor, and W. E. Paulson as a special committee to keep the southern states in the Union until the association has an opportunity to meet in the South.

L. J. NORTON, *Secretary-Treasurer*
(Approved) W. G. MURRAY, *President*

REPORT OF THE SECRETARY-TREASURER

Membership. There was a small net increase in membership between December 1, 1947, and September 1, 1948. (Our present membership is now approximately 1,300.) New members and subscriptions totaled 294, distributed as follows:

U.S.A. members	87
Canadian members	14
Other foreign members	27
Junior members	57
U.S.A. libraries and firms	29
Foreign libraries and firms	80
Total	294

Of these 27 were joint members with the Western Farm Economics Association and 18 with the Canadian Agricultural Economics Society.

Offsetting these were 203 drops and cancellations, distributed as follows:

U.S.A. members	70
Foreign members	19
Junior members	16
U.S.A. libraries and firms	46
Foreign libraries and firms	52
Total	203

One subscription of 28 copies was cancelled by a government agency. Eliminating this, the cancellations of U. S. libraries and firms would have been 18, and there was a net gain in each category of members and subscribers. On September 1 there were 113 junior members. We are getting quite a few new foreign members, and there would be more except for exchange difficulty. Any member who wishes to advance the cause of international intellectual cooperation can do so by paying the dues of a foreign member. Several of our members are now doing so.

Cancellation of membership is heavy among short-time members. The 70 drops among U. S. members had been on the books for the following periods: one year, 22; two years, 12; three years, 6; four to five years, 8; and over five years, 22. Some of the foreign cancellations resulted from exchange difficulties.

It is obvious that if we could hold all members who join, our membership would grow much more rapidly.

Finances. The association will apparently operate with a small cash surplus during the fiscal year. No changes have been made in securities held during the year. On September 3 holdings of stocks were valued at $19,392 and of U. S. government securities at $28,932. Allowing for rights received on stocks held, which rights have been sold, the value of securities held increased in value by $348 during the first nine months of the fiscal year.

Current operations for the first nine months of the fiscal year may be summarized as follows:

Cash on hand (August 31, 1948)	$18,449.84
Of this, reserve for Special Grants Fund was	11,075.00
Balance in current account	$ 7,374.84
Cash on hand (November 30, 1947)	5,557.08
Increase	$ 1,817.76

In the last three months of the last fiscal year our cash receipts and expenses were approximately equal.

During the current fiscal year we will publish four regular issues plus the special issue of annual meeting proceedings. In addition, the charges for printing the JOURNAL have increased substantially. Because of the difference in dates of the 1947 annual meeting and the election of officers, it was necessary to have a special meeting of the Executive Committee.

Suggestions. Based on two years' experience with the office, the Secretary-Treasurer believes that the association should employ a full-time clerk and secretary for the business office of the association. He believes that the association and the membership would be better served if this were done. It has not been possible for your secretary to work systematically on increasing the membership. The increase in membership has increased the work in the office. The association's income now appears adequate to absorb this cost.

The association will grow and extend its influence more rapidly if each member considers himself a member of the Membership Committee and

invites people who would find our JOURNAL and other activities of value to them to become members of the association.

L. J. NORTON

REPORT OF THE EDITOR

This is an interim report and a final report for the year will be made after the November issue. It does provide an opportunity for briefly reviewing the four-year period during which I have been editor.

This has been an interesting period in which to be an editor since it coincided with an expansion in the Association. In May of 1944 we mailed 1,174 copies of the JOURNAL and May of 1948, 1,874 copies, an increase of exactly 700 copies. During this period the size of the JOURNAL also increased. There were 876 pages in 1944 and 1,531 pages printed in 1947. This latter situation occurred because there were two annual meetings to be reported in that year. This year, under instructions from the Executive Committee, the JOURNAL is being held to 200 pages an issue, Costs increased at an alarming rate during the period. In 1944 the composition charge for a page of 10-point type, our typical page was $1.29. It is now $2.50. Only increasing membership has enabled us to cover our printing costs.

The task of the Editor has many compensations and satisfactions of a nonmonetary character. The duties of the office are, however, fairly arduous, in large part because they are added as a sideline to an already full load. The incoming editor might well be provided with more technical assistance than in the past. Nearly all associations provide such assistance more adequately than we do. Your new editor may have an eye for catching such things as whether postwar has been consistently used as a single word or has been hyphenated, or whether all the footnotes meet the standard form, but your present editor does not. This is a technical job requiring special skills and it is unreasonable to ask the editor to do it. In addition, there is a considerable load placed on the stenographic staff of the institution at which the editorial office is located. This involves perhaps two hundred communications for each number and the Association should at least partially compensate the staff for this. We cannot continue indefinitely to be subsidized by the institution at which the editorial office is located.

At the beginning of my tenure of office, we actively endeavored to stimulate articles, but toward the close the flow of material has increased until we have become largely a sifter of material. To solicit an article now means that we must reject a voluntary contribution. If the JOURNAL is to have a policy then solicitated articles are essential and we should provide means for expansion for this purpose.

The bulk of the material in the JOURNAL, however, depends upon the voluntary contributions of the membership. No editor can keep abreast of this material and its flow to the JOURNAL depends upon the efforts of the members. This is particularly true of the work of the younger members of the staff, and it is to be hoped that the older staff members and department heads will be alert in directing worth while writing to the JOURNAL.

The Editorial Council was charged with the selection of the title and editor for the volume of readings to be published by the Blakiston Company. It was decided that the volume should deal with agricultural policy and Dr. O. B. Jesness was selected as editor. The outstanding article published in the JOURNAL during the year of 1947 was selected by a committee composed of F. V. Waugh, F. F. Hill, E. C. Young and the editor. The next selection will cover the period from January 1, 1948 to the May issue in 1949 and subsequent selections will relate to four successive issues, beginning in August and ending in May.

I wish to particularly acknowledge the support and assistance of the Editorial Council and the work of the Associate Editors. There have also been many individuals too numerous to mention here who have contributed greatly by guiding articles to the JOURNAL and by constructive criticisms.

Respectively submitted,
WARREN C. WAITE

REPORT OF THE LIBRARY-CUSTODIAN

Satisfactory progress in assembling a library of the publications of the members of this Association may be reported at the end of the first year of the effort. Some fifty bound volumes and a quantity of bulletins and offprints are now on the shelves. Prominent among the books are the series *American Cooperation*, and most of the books of Edwin Nourse. A number of the works have been contributed by foreign scholars, including the Chinese.

The growing mass of bulletin publications raises a problem of handling. We asked that they be submitted in bound collections, but that has not always been practical from the standpoint of the donors. It will soon be necessary to provide boxes for such publications in anticipation of ultimate binding.

Your Committee on the Library recognizes, however, that the chief aim is still to collect the works which should be on our shelves. We have been disappointed that some of the veterans of the Association have not yet been able to present their works. We know that some of them have been deterred by the scarcity of some of their volumes. During the next year we propose to make a concentrated effort to crack this part of the problem. Success in acquiring more of the works of the early leaders in the field should increase the Library's standing and prestige so that regular contributions may well become habitual to Association members as they get into print. We are enlisting the support of those who can and will aid in this critical phase of our operation.

No progress has yet been made as to the ultimate housing and use of the Library. Most research libraries in the United States suffer from overcrowding at present, but once that situation is relieved there is reason to believe that existing libraries will be willing to house and administer such a collection so that it may have the maximum use and security. The Director of the State Historical Society of Wisconsin, Dr. Clifford Lord, had indicated a lively interest in our collection. Upon the completion of the projected University Library, there should become available in the Society's building an adequate space for shelving and for study usage.

The Committee on the Library is considering the question of regulation of the use of the Library to create the best opportunity for service to scholars.

Respectfully submitted,
WILBUR H. GLOVER

September 10, 1948

To: Dr. WILLIAM G. MURRAY, *President*
The American Farm Economic Association

Subject: Report on Work of Special Grants Committee for 1948

The Special Grants Committee was appointed in 1947 to raise funds for a Meritorious Research Award to be conferred annually for the outstanding piece of research published in the field of agricultural economics. The Committee—consisting of Mr. Arthur, Mr. Hoffman, and myself—met several times during the year to discuss the form of the solicitation letter and the list of persons and organizations to be contacted.

Based on our recommendations made at the Annual Meeting last year, it was felt that the solicitation should be general enough to include a good cross-section of business firms and enterprises, and all letters should be written on American Farm Economic Association stationery. It was decided that Mr. Hoffman would contact the dairy companies and suppliers of dairy equipment, some of the edible oil companies, and the cooperatives. Mr. Arthur agreed to solicit the meat packers, fertilizer associations, a few farm implement companies, and some of the cooperatives. I agreed to canvas the grain, feed, and milling trade, and a number of the vegetable oil companies.

We began our solicitation about May 1, 1948, and made two subsequent follow-ups. We have received $12,925 to date from a total of 120 firms solicited. We also received a few rain checks from firms who said they were unable to include in their budget this year but suggested that we contact them at some future date. In addition, we are holding a check for $1,000 from Cargill, Incorporated, pending confirmation from the Treasury Department stating that contributions to this fund are tax exempt. There is a complete record of all firms contacted and replies received in our files if the Committee has need of them at any future date.

In response to your request, I have checked with the other members of the committee and we have no specific recommendations to make to the Executive Committee at this time regarding the use of the funds raised, other than the following suggestions which were made in our report last year:

1. Consideration might be given to awarding more than one prize annually.
2. Arrangements might be made to assist in printing the prize-winning papers for general distribution as a number of those contributing expressed a desire to receive copies of the research results.

We feel that the program as outlined by the Special Awards Committee is very adequate.

I would like to express my appreciation to both Mr. Arthur and Mr. Hoffman for their assistance and cooperation.

JULIUS HENDEL, *Chairman*
Special Grants Committee

1949 ANNUAL MEETING

It is essential that plans for annual meetings of the Association be initiated 18 months or two years in advance of the dates of these meetings. The membership of the Association has recognized this situation with general instructions to its Executive Committee to so proceed. Hence your 1948 Executive Committee already has gone forward with tentative plans for the 1949 meeting.

In past years our Association has taken action to promote greater mutuality of interest, primarily through arrangements for joint membership, with the Western Farm Economics Association, the Canadian Agricultural Economics Society and like groups. Still another move toward this end is the idea of joint meetings with these affiliated groups. A step in this direction is proposed for 1949. Tentative plans have been made looking toward a joint meeting in 1949 with the Western Farm Economics Association at a location accessible to both groups.

Looking beyond 1948, an invitation already has been extended officially by the Canadian Agricultural Economics Society for a joint meeting in Canada in 1950. In view of Statements made by our Southern members, I have no doubt that they are anxious to have an annual meeting of our Association held in North Carolina or some other comparable place in their region at the earliest possible moment.

Finally as to joint meetings with the other social science groups, even though our annual meeting takes the form of a summer session, there remains the opportunity to develop further what is the equivalent of a second meeting of our Association each year. For 1948, joint sessions have been arranged by your President with two of the social science groups meeting in Cleveland in December. In later years, such joint sessions might well be supplemented by a separate session or two of our own group. Thus contacts with the other social science groups can be maintained to the advantage of all concerned.

(Signed) HAROLD HEDGES

REPORT ON ESTABLISHMENT OF STUDENT CHAPTERS

A few months ago a movement was initiated by the officers of the Aggie-X Club at Oklahoma A. & M. to form a national organization of Aggie-X Clubs. After brief consideration of this movement, it seemed desirable to explore the possibility of making provision for the formation of student sections of the American Farm Economic Association on college campuses. This has been done by certain other professional societies, notably the American Society of Agronomy.

It is proposed that provision be made for student sections of the Ameri-

can Farm Economic Association. The following paragraph will be added at the end of the present Article III:

"Student sections of the American Farm Economic Association may be authorized in colleges or universities that offer courses in agricultural economics, farm management, or allied fields. Establishment of student sections shall be under such rules as the Executive Committee may decide."

The Executive Committee recommends that a student in an accredited college or university authorized to grant degrees, who, by his selection of courses has indicated an interest in agricultural economics or farm management, may affiliate with the American Farm Economic Association as a student affiliate. Such student must be a member of the student section of the American Farm Economic Association on his campus.

Student sections may form a national student organization, hold meetings, elect officers, arrange programs, and adopt a constitution and by-laws, provided that such constitution and by-laws do not conflict with the constitution and by-laws of the American Farm Economic Association. The national student organization may decide the time and place of its annual or special meetings, with the approval of the AFEA officer in charge of student sections.

The First Vice President of the American Farm Economic Association shall be charged with the responsibility of supervising student sections of AFEA and the national student organization.

(Signed) EARL BUTZ

REPORT ON THE POLICY COMMITTEE OF THE AMERICAN FARM ECONOMIC ASSOCIATION

Two years ago, when Asher Hobson was demoted from Secretary-Treasurer to President, he made a very interesting report. This report showed that by following conservative policies we had been able to build up a reserve fund of over $50,000. Dr. Hobson went on to express the hope that "with these reserves the Association is now in a position to expand its activities without the constant threat of insolvency."

This hope—shared by most of us—was based upon the assumption that the $5 membership fee would take care of our regular expenses, and that we could finance new activities from the income received from investments. The Executive Committee was ready to throw off its traditional conservatism and to recommend the spending of Association money for new activities.

But when the Executive Committee met early this year it was informed that we were faced with rising costs and might actually experience a deficit. Our biggest cost is printing. We found that five issues of the JOURNAL this year would cost about $5 for each set sold. Thus, the regular membership fee of $5 barely covers the cost of the JOURNAL, and provides nothing for other regular expenses nor for expansion.

In view of this situation President Bill Murray appointed a policy committee and asked it to bring in recommendations for consideration by the Executive Committee and by the members of the Association.

We have looked at this assignment primarily as a problem in economics.

We have considered several possible courses of action and have tried to estimate their effects upon our income and our expenses over a period of years. We were not so hard-boiled, though, as to look at the job entirely from a monetary point of view. We certainly recognized that the Association is not in business to make money, but to stimulate progress in our profession.

Early in its work, the committee wrote to all the living past presidents of the Association. Almost all of them replied. Their letters have been invaluable not only for the specific advice given, but also for the general background they give of our history, our early difficulties, and our gradual growth in size and in influence.

The Policy Committee makes the following recommendations:

1. *Objectives of the Association.*

We can not have a clear and consistent policy unless we have a thorough understanding of our objectives, or purposes.

Article II of the Constitution reads.

"*Object.* The object of this association shall be to promote effective investigation and free discussion of topics and issues in Agricultural Economics, and higher standards of accomplishments in research, teaching, and extension in this field by fostering study, writing, and contacts which contribute to these ends."

The committee believes that it would be desirable to state our objectives more specifically, and in greater detail. We recommend that the following statement be substituted for Article II of the Constitution:

Objectives: The objectives of this association shall be:

1. To encourage effective investigation and free discussion of the various topics and issues in Agricultural Economics.
2. To promote and maintain high standards of accomplishment in research, teaching, and extension in agricultural economics by fostering study, writing, and contacts which contribute to this end.
3. To stimulate objective analysis and discussion of existing and proposed economic policies and programs affecting the welfare of farmers or affecting the general public as consumers of food and fiber.
4. To provide a means of publication (JOURNAL OF FARM ECONOMICS) for scholarly analyses and research findings in the field, and other items of general interest to the membership.
5. To promote interest in and understanding of the profession of agricultural economics among undergraduate students in American colleges.
6. To provide a medium for effective professional cooperation between agricultural economists and scientists in other fields.
7. To solicit the interest and support of farmers, consumers, and other economic groups in the study and analysis of the economic problems of agriculture.

With the above objects in mind, we make the following further recommendations:

2. *Reserve fund.* For 20 years we followed a conservative policy to build a reserve fund. We set a goal of $50,000. That goal has been reached. We recommend:

a. That further efforts to increase the reserve fund be secondary; but that

b. We should take steps during the coming year to guard against depletion of these reserves, with the goal of holding the fund at about $50,000.

3. *Regular expenses.* The committee considered many possible reductions in expenditures. The only substantial reduction would be that resulting from a cut in the size of the JOURNAL. The committee does not recommend such a cut at this time. If the Association should experience deficits in the next year or two we will need to consider returning to the basis of 4 issues a year instead of the present 5 issues. But this should not be done unless it is clearly necessary. The high standard set by the JOURNAL in recent years should be maintained.

The committee recommends continuing for at least one more year all other authorized expenditures, including the $100 prize for the best JOURNAL paper. We suggest that, in addition to the cash award, the winner be given a suitable scroll or memento.

4. *New expenses.* While we were building up our present reserve fund we were conservative about spending money. We do not propose now to become spendthrifts. Our policy should be to put the Association as rapidly as possible on a sound financial basis, in order to expand our activities in a variety of ways.

When we are in a position to increase our expenditures, first priority should be given to paying for clerical help for the Secretary-Treasurer and for the Editor of the JOURNAL.

5. *Membership.* We recommend an active membership drive during the coming year. Not only should this drive be directed to every professional agricultural economist; we should enlist the support of any interested person.

Some non-economists might think, this a peculiar way to meet our budgetary situation. If the membership fee barely covers the cost of the JOURNAL, why try to get more? The answer is that the marginal cost of printing an additional set of the JOURNAL is about $2.50. We make a profit of 100 percent on each additional member.

We recommend further that the Executive Committee of the Association appoint a "Membership Council" with the Secretary-Treasurer as "Membership Chairman," whose duty it will be to organize and conduct a campaign to increase the paid membership in the American Farm Economic Association. Membership on this council should be representative of the major geographical areas of the country, and should also represent institutional groupings such as USDA, Chicago area, agricultural industries, and the like. It should be the goal of the membership council to raise the total number of individual numbers from the present figure of 1,310 to something over 2,000. In succeeding years this goal might be raised even higher.

6. *Membership fees.* We recommend that the present membership fee of $5 be maintained for at least one more year; and that during that year no change be made in the fees for Junior members nor for joint memberships with the Western and Canadian Associations.

We know that most other professional associations have found it necessary to raise their dues. There is at least one striking exception. The American Economic Association has been able to continue its $5 rate because of its membership of about 5,000.

But our $5 rate is not sacred. It was established in the early 1920's when prices, and incomes, were far below present levels. Within two years we should be prepared to provide from $2,000 to $3,000 a year for clerical help to the officers. We should publish a new membership directory and an index of the JOURNAL. We should take on many new activities. If within two years it is clear that we can not do these things without raising our dues, we should raise them. But we feel it is important to keep the dues as low as is consistent with our ability to expand our activities and to make real progress.

7. *Fiscal year and election of officers.* We recommend that, if the fall annual meetings are continued, the fiscal year of the Association be changed to end at about the time of the meeting.

We further recommend that the election of officers take place before the annual meeting, and that the new officers begin their term of service immediately after the meeting. This will give the members full information on the current budgetary situation at the time of the meeting; it will let them know their new officers; and it will avoid the time and expense of a special meeting of the Executive Committee.

8. *Recognition of past presidents.* Our correspondence with past presidents has been stimulating to us. It was especially delightful to hear from such old-timers as Dr. H. A. Morgan, president in 1916 and until this year a director of TVA; Mr. H. W. Jeffers, president in 1917 and still in the milk business in New Jersey; and Dr. G. A. Billings, president in 1918 and for many years a member of the U. S. Tariff Commission.

But it is sad to realize that 9 of our past 37 presidents have died. This includes the first 4—Spillman, Warren, Otis, and Boss.

Perhaps the committee is going beyond the intended scope, but it is inclined to suggest to the incoming officers that some suitable way be found to perpetuate the memory of these men. One possibility is a set of autographed photographs to be collected by the Library Custodian. Another is that the JOURNAL publish a series of short letters by the oldest past presidents.

Summary

The Association should not consider a policy of retrenchment. We must go forward. We should not curtail our program. Our greatest need is for new members. We propose a drive to get them. In the meantime, we propose continuing the present membership fee of $5.

Signed: FREDERICK V. WAUGH, *Chairman*
L. J. NORTON
E. L. BUTZ

REPORT OF MARKETING GROUP

At your suggestion a meeting of association members interested in marketing was held to consider whether this association should have a

Committee on Marketing and, if so, what functions such a committee should perform. This group also considered the suggestion of the American Marketing Association that a joint Committee on Agricultural Marketing be set up to deal with matters of mutual interest, to avoid duplication and to coordinate and strengthen relationships between the two groups. The vice-chairman of the Agricultural Marketing Committee of the American Marketing Association, Mr. L. D. Colburn, and another member of that committee, Mr. R. J. Eggert, were among those who attended this meeting.

The consensus of views expressed at the meetings was that this association should have a Committee on Marketing and that one of the functions of this committee should be to collaborate with the Agricultural Marketing Committee of the American Marketing Association on matters of common interest.

It was apparent from the discussion that there are a number of problems on which such a committee could make a valuable contribution. Some of these problems to be considered by the committee for study are:

1. The development of a program on marketing for the annual meeting of the association, if the President of the association sees fit to use the committee for that purpose.
2. Recruitment and training of personnel for marketing work, including a study of the kinds of training needed for various types of jobs in this field and the adequacy of training provided by the agricultural colleges, commerce colleges, and other institutions.
3. Marketing research, with particular attention to objectives, methodology, and kinds of projects that need to be undertaken. Such special problems as how to bring about more effective organization and conduct of regional research and how to work out more satisfactory relationships between federal agencies and the educational institutions may well be considered by the committee also.
4. Ways of bringing about more prompt and more effective use of the findings of marketing research. This will involve a consideration of extension work in marketing and the possibility of developing more effective methods of bringing the findings of marketing research to the attention of those who can use them for public as well as private advantage.

While it is recognized that other agencies are dealing with some of these problems, we believe that a committee of this association, working with a similar committee of the American Marketing Association, can render useful service.

Under the circumstances, it seems best to appoint a committee in which various aspects of marketing, such as research, teaching, and extension, are represented and to give this committee a rather broad assignment so that it may select for special attention those matters with which it can deal to the greatest advantage.

(Signed) LELAND SPENCER, *Temporary Chairman*

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